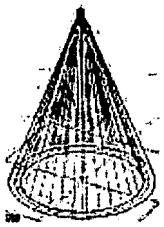

Anti-Stealth, LLC

January 21, 2008

RECEIVED

JAN 25 2008

LICENSING & REVIEW

Jim Geer
Anti-Stealth, LLC
5346 Stadium Trace Parkway
Suite 214
Birmingham AL 35244

USPTO
Licensing and Review
Room 4B31
501 Dulany Street
Alexandria VA 22313

09-545,407

RE: Secrecy Order for U.S. Patent Application 09/454,4074

Dear Sir or Madam:

We own the above-identified U.S. Patent Application, which is subject to a Secrecy Order, at the request of the U.S. Air Force.

This Secrecy Order has been renewed each year since it was first issued, Aug 1, 2001. We have attached a copy of the latest renewal notice.

We talked to the U.S. Air Force attorney, Mr. Chaing, to request that the secrecy order be rescinded, in order to permit us to commercialize our intellectual property for friendly foreign governments as well as corporations.

Mr. Chaing indicated that we should contact the U.S. Patent Office. We followed up by calling the USPTO, and spoke with a Mr. Carone, who told us to send the letter to this address.

The patent application in "Condition for Allowance" is for a "Stealth Radar" that provides a system and method for detecting, locating and ranging stealth objects of any kind, such as stealth (low observable) satellites, stealth cruise missiles, stealth aircraft, stealth boats, and stealth unmanned pilotless vehicles, such as stealth unmanned aerial vehicles (UAV) or stealth unmanned land or water vehicles.

We believe there are significant commercial opportunities to sell our stealth radar system to foreign countries as well as corporations, and present these in our attached business plan. These opportunities are consistent with the interests of U.S. national security and the "war on terror", and the commercial unavailability of our technologies is believed to impede these interests. Indeed, commercialization will also facilitate availability for U.S. military interests.

For example, stealth cruise missiles are a threat to naval ships and boats of UK, India, Israel and other countries. These could be Chinese, North Korean, or Iranian stealth cruise missiles launched by Iran or provided to a terrorist group.

As another example, corporations could use our stealth radar to protect against terrorists with stealthy boats who could ram an oil tanker and not just sink the tanker but cause a massive oil spill and ecological disaster.

These corporations could acquire our Anti-Stealth Radar or they could use our "Radar as a Service" service, under which stealth detection services are made available without transferring ownership or control over the anti-stealth facilities.

Some of our stealth radar designs incorporate a platform (craft) with a passive (non-transmitting) receiver and no transmitter on the receiving craft.

Thus, in addition to detecting stealth craft, another market for our stealth radar is for incorporation into stealth craft. Stealth craft need to minimize electromagnetic transmissions so as to remain stealthy, so our stealth radar is ideal for use in stealth planes, UAV's, cruise missiles, boats, and other stealth craft, because there is no microwave or IR transmission that could be used to track the stealth craft.

Cloaked Radar

The "stealth radar" can also detect and range the new cloaked devices being developed. For cloaking developments, see the article on Microwave invisibility cloaking in the Oct. 12 2006 Science News and the cover page article in the Aug 14, 2006 EE Times.

Radars are in use at various military and commercial installations for perimeter security, and they can detect vehicles as well as humans walking or running.

The new cloaking devices under development will reportedly be able to defeat standard Radar detection. Thus, the ability of the technology to detect and range cloaked devices could be valuable to foreign military as well as commercial interests.

For example, a chemical or oil company might find this technology invaluable to guard against a cloaked terrorist.

Stealth Radar Sales

As shown in our business plan the radar market for the next ten years is projected to be $40 billion. If we assume the commercial and foreign government part of this market (i.e., the non US government or US military) part is 2/3, then this is a $27 billion dollar market.

We would develop and sell the radar and also license the technology for others to use.

Some of our techniques make free use of "illuminators of opportunity" such as commercial HDTV television broadcasts, HDTV Direct Broadcast satellite TV, satellite radio, WiMax, and weather radar, which reduces our cost vis-à-vis solutions requiring transmitters.

One peculiar thing about the Stealth Radar is that the value to a foreign Air Force could be in keeping others from using it against them, as much as them using it themselves!

In order that we may commercialize this technology, for non-US Government use, we respectfully seek rescission of the Secrecy Order.

Sincerely yours,

Jim Geer
Anti-Stealth, LLC

Attachment I – Renewal of Secrecy Order

Attachment II – Anti-Stealth Radar Business Plan

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10 BANK STREET, SUITE 460
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[1] ALSO ADMITTED IN CT
[2] ALSO ADMITTED IN NJ
[3] ALSO ADMITTED IN FL

August 16, 2007

Mr. James L. Geer
1592 Southpointe Drive
Hoover, AL 35244

Re: U.S. Patent Application Serial No. 09/545,407
"METHOD AND APPARATUS FOR THE DETECTION OF OBJECTS USING ELECTROMAGNETIC WAVE ATTENUATION PATTERNS"
Our Ref.: GEER 201

Dear Jim:

We have now received a notification from the U.S. Patent and Trademark Office that the Secrecy Order entered into the above-identified matter has been renewed for a period of one year. Therefore, the terms of the Secrecy Order under 35 USC § 181-188 remain in force.

Please let me know if you have any questions or concerns.

Very truly yours,

Steven M. Hoffberg

SMH:mp
Encl.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/545,407	04/07/2000	James L. Geer	Geer-201	9725

10037 7590 08/06/2007

MILDE & HOFFBERG, LLP
10 BANK STREET
SUITE 460
WHITE PLAINS, NY 10606

AUG 16 2007

EXAMINER	
ART UNIT	PAPER NUMBER

DATE MAILED: 08/06/2007

RENEWAL OF SECRECY ORDER
(35 U.S.C. 181-188)

NOTICE: To the applicants, legal representatives of applicants, and any and all assignees, and any legal representatives of the same.

The appropriate Government agency has notified the Commissioner for Patents that an affirmative determination has been made by the Government agency, identified below, that the national interest required renewal of the secrecy order. The secrecy order is therefore, renewed, effective for a period of **ONE YEAR** from the mail date of this renewal notice.

The secrecy order may be renewed for additional periods of not more than one year upon notice by a Government agency that the national interest so requires.

GOVERNMENT AGENCY: ☐ **ARMY** ☐ **NAVY** ☒ **AIR FORCE** ☐ **NASA**
☐ **DOE** ☐ **DOJ** ☐ **HOMELAND SECURITY**
☐ **OTHER**

Valerie Shao

for
Director, Technology Center 3600
(571) 272-5150

PTOL-416 (Rev. 11/06)

AHH

COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

Serial Number	Filing Date	First named Applicant	Attorney Docket Number
09-545,407		Geer	

Examiner

Art Unit

Date Mailed
8-6-07

ATTN: LICENSING & REVIEW BRANCH

RENEWED SECRECY ORDER RECEIPT

The Renewal Of Secrecy Order under Title 35, United States Code (1952). Sections 818-188, dated 8/6/07, in the above-identified application is hereby acknowledged.

Signature _____ Date 8/16/07

City White Plains State NY

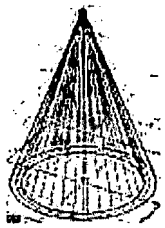
Return only the upper portion to:

U.S. DEPT. OF COMMERCE
COMMISSIONER FOR PATENTS
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450
ATTN: LICENSING & REVIEW

TO THE APPLICANT ABOVE NAMED OR HIS OR HER HEIRS, AND ANY AND ALL ASSIGNEES AND ATTORNEYS OR AGENTS:

Enclosed is your copy of a Renewal of Secrecy Order under Title 35, United States Code (1952), Sections 181-188. In order that the record of service of this Order may be complete as soon as possible, you are respectfully requested to fill out and personally sign the receip above and promptly return it to the Commissioner of Patents and Trademarks.

J.C. Samuels
Licensing and Review



Anti-Stealth, LLC

Business Plan

Executive Summary

Introduction

Anti-Stealth, LLC is a start-up organized to provide technology and services for detecting, locating and ranging stealth objects of any kind, such as stealth (low observable) satellites, stealth cruise missiles, stealth aircraft, stealth boats, and stealth unmanned pilotless vehicles, such as stealth unmanned aerial vehicles (UAV) or stealth unmanned land or water vehicles.

Our technology, hereafter called Stealth Radar, is subject to a Secrecy Order, at the request of the U.S. Air Force. Our Stealth Radar is protected by a patent in "Condition for Allowance."

We believe there are significant commercial opportunities to sell our Stealth Radar system to foreign countries and both domestic and foreign corporations. These opportunities are consistent with the interests of U.S. national security and the "war on terror."

Our Stealth Radar system and services are needed by corporations and foreign governments because unobserved stealth craft can pose a threat to these corporations and governments.

For example, stealth cruise missiles are a threat to naval ships and boats of the UK, India, Israel and other countries. These could be Chinese or Iranian stealth cruise missiles launched by Iran or a terrorist group.

As another example, corporations could use our Stealth Radar to protect against terrorists with stealth boats who could ram an oil tanker and not only sink the tanker but cause a massive oil spill and ecological disaster.

These corporations could acquire our Stealth Radar or they could use our "Radar as a Service" service, under which stealth detection services are made available without transferring ownership or control over the anti-stealth facilities.

In addition to detecting stealth craft, another market for our Stealth Radar is for incorporation into stealth craft. Some of our Stealth Radar designs incorporate a craft with a passive receiver and no transmitter on the receiving craft, allowing stealth craft to minimize electromagnetic transmissions and remain stealthy. Thus, our Stealth Radar is ideal for use in stealth planes, UAVs, cruise missiles, boats, and other stealth craft, because there is no microwave or IR transmission that could be used to track the stealth craft.

The use of passive, as opposed to active radar, also reduces the power requirements for the craft, which is particularly important for extending the operating time in air of a UAV.

The Stealth Radar can also detect and range the new cloaked devices being developed. For cloaking developments, see the microwave invisibility cloaking cover page article in the Aug. 14, 2006 issue of the EE Times.

Products and services

We will develop and sell Stealth Radar systems to corporations and foreign governments.

We would also provide a Stealth Radar service, whereby we would supply staff and operate our Stealth Radar, supplying it as a service.

For example, we could operate our Stealth Radar from a blimp over shipping choke points such as the straits of Malacca, and offer real-time radar tracking to Shell, Exxon and other companies with oil tankers who might find this service invaluable to protect against terrorists with stealth craft.

Financial Projections

Radar sales for the next ten years are projected to be 9,800 units for $40 billion. This gives an average price-per-unit of 4.08 million dollars. If we assume the commercial and foreign government (i.e., the non US government or US military) sector of this market comprises 2/3 of the entire market, then this is a $27 billion dollar market.

If we capture just 2% of the $27 billion radar product sales, and our radar service sales are 50% of our radar product sales, then our ten-year sales would be $610 million.

Assuming a 20% profit margin on sales, then our ten-year profit would be $109 million, with a net present value of $65 million.

However, we think we can do better than 2% of radar product sales. If we capture 6% of the radar product sales, and our radar service sales are 50% of our radar product sales, then our ten-year sales would be $1.3 billion.

Assuming a 20% profit margin on sales, then our ten-year profit would be $247 million, with a net present value of $148 million.

Table of Contents

Description of Business

We believe there are significant commercial opportunities to sell our Stealth Radar system to foreign countries and both domestic and foreign corporations.

Our Stealth Radar and Stealth Radar services are needed by corporations and foreign governments because unobserved stealth craft can pose a threat to these corporations and governments.

For example, stealth cruise missiles are a threat to naval ships and boats of the UK, India, Israel and other countries. These could be Iranian Stealth Cruise missiles launched by Iran or Chinese or Iranian stealth cruise missiles that make their way into a terrorist group's possession and are then launched by a terrorist.

India could use our Stealth Radar to protect its cargo and military ships in the Indian Ocean or choke points such as the straits of Malacca from stealthy boats and UAVs that could be a threat.

Corporations could use our Stealth Radar to protect oil tankers against terrorists with stealthy boats who could not only sink the tanker but also cause a massive oil spill and ecological disaster.

Also, modern-day pirates operating out of Africa could use a stealthy boat to seize an oil tanker at night.

These corporations could buy our Stealth Radar or they could use our "Radar as a Service" service.

There are various platforms on which our Stealth Radar could be mounted. In addition to the traditional planes and ships, there are various types of UAVs, HALE craft, blimps and satellites. See Appendix 16: "Blimp 25 Times larger than Goodyear's," Appendix 17: "Integrated Sensor is the Structure," and Appendix 18: "Air Ball."

Some of our Stealth Radar designs incorporate a platform (craft) with a passive (non-transmitting) receiver and no transmitter on the receiving craft.

Thus, since stealth craft need to minimize transmissions so as to remain stealthy, our Stealth Radar is ideal for installation in stealth planes, UAVs, cruise missiles, boats, and other stealth craft because there are no microwave or IR transmissions that could be used to track the stealth craft.

We have 21 patented claims, and these include techniques using both active and passive monostatic radars, as well as both active and passive multi-static radars.

A few of our techniques make free use of "illuminators of opportunity" such as commercial HDTV television broadcasts, HDTV Direct Broadcast satellite TV, satellite radio, WiMax and weather radar, which reduces our cost with respect to designs requiring transmitters.

One advantage of passive radar over active radar is that in military scenarios active radar transmission can reveal both the existence and the location of the transmitter.

Another advantage of passive radar is that the overall system cost may be cheaper, since a transmitter is not needed on the detecting craft. Also, passive radar can consume less power (electricity) than Active radar, particularly if "illuminators of opportunity" are used.

There are several technologies that facilitate our Stealth Radar, including advances in uncooled IR sensors and flash LADAR, technologies that produce very large, stowable, lightweight, low-power phased-array radars, and software-defined RADAR.

See Appendix 19: "Open Source Software-Defined Radar," Appendix 20: "Infrared," Appendix 21: "Lightweight AESA Phased Array Radar," and Appendix 22: "Techniques for Narrow Beamwidths."

Cloaked Radar

The Stealth Radar can also detect and range the new cloaked devices being developed. For cloaking developments, see the article on microwave invisibility cloaking in the Oct. 12, 2006 issue of Science News and the cover page article in the Aug 14, 2006 issue of EE Times.

Radars are in use at various military and commercial installations for perimeter security, since they can detect vehicles as well as humans walking or running.

The new cloaking devices under development will reportedly be able to defeat standard RADAR detection. Thus, the ability of the technology to detect and range cloaked devices could be valuable to foreign military as well as commercial interests.

For example, a chemical or oil company might find this technology invaluable to guard against a cloaked terrorist.

Markets

Stealth Radar Sales

The radar market is a several-billion dollar worldwide market, and includes military radar and commercial radar. Major radar manufacturers include Northrop Grumman, Raytheon, Thales, MEADS International, Rockwell International, and Lockheed Martin.

As shown in Appendix 1: "Global Radar a $40 Billion Market" below, the radar market for the next ten years is projected to be $40 billion. If we assume the commercial and foreign government (i.e., the non US government or US military) sector of this market comprises 2/3 of the entire market, then this is a $27 billion dollar market.

For more on the threat of stealth craft, see Appendix 2: "Stealth technology now a real threat to US forces?"

There is a worldwide proliferation of stealth craft and missiles of all types, including stealth UAVs, stealth cruise missiles, and stealth boats, as shown in the "Threat of Stealth UAVs," "Threat of Stealth Cruise Missiles," and "Threat of Stealth Boats" sections below.

One way to protect a country and its littoral waters from stealth UAVs, stealth cruise missiles and stealth boats and ships, is to have an electronic "picket fence" of Stealth Radars around the perimeter of the country. For example, you could have a Stealth Radar positioned at each twenty-mile interval along the border, to detect and track both stealth and non-stealth craft.

India has a total of 9,380 miles of land border, plus a coastline of 4,659 miles.

To fully protect India, 702 Stealth Radars would be required, assuming one Stealth Radar occurring each 20 miles.

Assuming 20 counties are to be protected, and each country has one-half the border length of India, then 20 * 351 or 7,020 Stealth Radars would be required. Assuming a cost of $4 million per system, that would be equivalent to $28 billion in Stealth Radar sales.

The total ten-year estimated radar market does not assume any of these "picket fences" will be developed.

Since stealth craft need to minimize transmissions in order to remain stealthy, our Stealth Radar is ideal for installation in stealth planes, UAVs, cruise missiles, boats, and other stealth craft, because there are no microwave or IR transmissions that could be used to track the stealth craft.

Assuming 7,554 stealth UAV units produced in the next ten years, as shown in "The Threat from Stealth UAVs" section below, and a price of $400,000 for the Stealth Radar for each UAV, then this would be a 7,554 * $400,000, or $3 billion market.

As mentioned above, our Stealth Radar can detect and track both stealth and non-stealth craft. One non-military use for the Stealth Radar is to monitor automobile traffic patterns.

The use of passive, as opposed to active radar, also reduces the power requirements for the detecting craft, which would be particularly advantageous to extend the operating time of a UAV monitoring automobile traffic patterns.

Another market for our Stealth Radar is to retrofit the radar on existing jet aircraft so the aircraft can detect and track the growing number of stealth craft.

One peculiarity of the Stealth Radar is that its value to a foreign Air Force could lay in keeping others from using it against them as much as using it themselves!

In our first round of financing, we seek to raise 3 million dollars. We would use these funds to perform simulations of the Stealth Radar for the markets we see as most promising for immediate revenue, such as the following:

Detection and ranging of stealth boats, UAVs and stealth cruise missiles;

Detection and ranging of stealth satellites;

Use of passive Stealth Radar within stealth craft, for the ultimate in low-probability-of-interception radar.

These simulations would show which of our patented techniques are most promising for each of these three markets, and suggest optimum antenna size, wavelength, effective surveillance distance, and platform (such as a blimp) needed.

We would also test the latest versions of the open source "Software-defined Radar" software and FPGA's, to see how much of the radar we can implement in software for our various techniques.

See Appendix 19: "Open Source Software-Defined Radar."

In our next round of financing, we would raise 10 million dollars to develop production radar, to begin to market and sell our Stealth Radar, and to begin to build our "Radar as a Service" infrastructure.

We will use off-the-shelf hardware. Some of our techniques use AESA phased-array antennas, while others techniques use differential microwave radiometers.

The use of existing hardware makes the development of the Stealth Radar much less expensive than it would have been had we needed to develop new hardware.

We would develop and sell the radar, as well as license the technology for others to use.

Radar as a Service

In addition to selling Stealth Radars, we would also offer a radar service, for which we would use HALE (high-altitude, long-endurance) craft, blimps, and other unmanned aerial vehicles as platforms to mount our Stealth Radar and to monitor satellites and ships for attack by stealth craft.

Instead of a corporation or government buying our Stealth Radar, they would subscribe to our Stealth Radar service, and we would do the surveillance for them.

For example, stealth cruise missiles, stealth UAVs and stealth boats are a threat to oil tankers. Also, modern-day pirates operating out of Africa could use a stealthy boat to seize an oil tanker at night.

For our "Radar as A Service" business we would use our own Stealth Radar for surveillance of the oil shipping lanes close to Africa and the Middle East.

A consortium of Shell, Exxon and other companies with oil tankers might find this service invaluable to protect against terrorists with stealth craft, without needing to buy and operate their own Stealth Radar. The Stealth Radar could also be used to protect off-shore oil platforms.

In addition to an explosive payload for a stealth cruise missile, UAV or boat, the craft could have a biological, chemical, dirty nuclear or even nuclear-weapon payload.

There are billions of dollars being invested to detect missiles, crafts, satellites and the like, and we anticipate there will be billions invested to detect stealth and cloaked versions of same.

Our business plan includes participating in these billions of dollars of investments.

Financial Projections

As shown in Appendix 1: "Global Radar a $40 Billion Market" below, the radar market for the next ten years is projected to be $40 billion with 9,800 units sold. If we assume the commercial and foreign government (i.e., the non US government or US military) sector of this market comprises 2/3 of the entire market, then this is a $27 billion dollar market.

Assume a 20% profit margin, a present value discount value of 6%, a 25% sales growth rate each year after year three, and only commercial and foreign government sales.

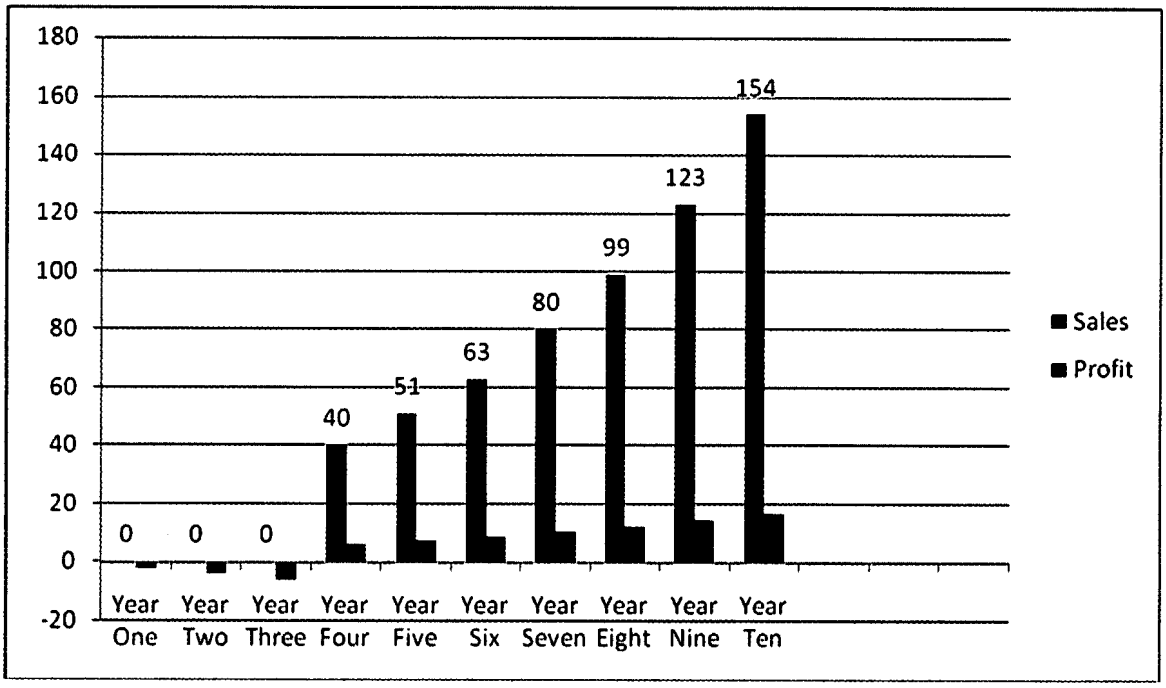
Assume our sales at year three are 1% of total radar sales and at year ten are 3.81% of total radar sales.

Assume our "Radar as A Service" offering will generate 50% of the revenue of our radar sales.

Sales and Profit Forecast

Yr	Radar Mkt. (Billions)	Anti-Stealth Sales/Profit (Millions)	Mkt. (%)	Anti-Stealth Services (Sales/Profit)	Total Profit (Mln)	Total Profit Present Value (Millions)
1	2.7	0 / 0	0.00	0 / 0	-2.0	-2.0
2	2.7	0 / 0	0.00	0 / 0	-4.0	-3.6
3	2.7	0 / 0	0.00	0 / 0	-7.0	-5.9
4	2.7	27 / 5.4	1.00	13 / 2.6	8.0	6.3
5	2.7	34 / 6.8	1.25	17 / 3.4	10.2	7.6
6	2.7	42 / 8.4	1.56	21 / 4.2	12.6	8.8
7	2.7	53 /10.6	1.95	27 / 5.4	16.0	10.6
8	2.7	66 /13.2	2.44	33 / 6.6	19.8	12.4
9	2.7	82 /16.4	3.05	41 / 8.2	24.6	14.6
10	2.7	103 /20.6	3.81	51 /10.2	30.8	17.1
Totals						
	27	**407 /81.4**	**2%**	**203/40.6**	**109**	**65.9**

Sales and Net Present Value of Profits Forecast Chart – Millions of Dollars



Six Year Cash Flow Forecast

Yr	Anti-Stealth Sales & Service Revenue (Millions)	Anti-Stealth Expenses (Millions)	Cash (Millions)
1	0	2	(2)
2	0	4	(4)
3	0	7	(7)
4	40	32	8
5	51	41	10
6	63	50	13
Totals (Millions Dollars)	154	136	18

Sales and Profit Forecast assuming 50% per year growth

We believe the above sales forecast is very conservative with respect to our sales percentage of the total estimated radar market.

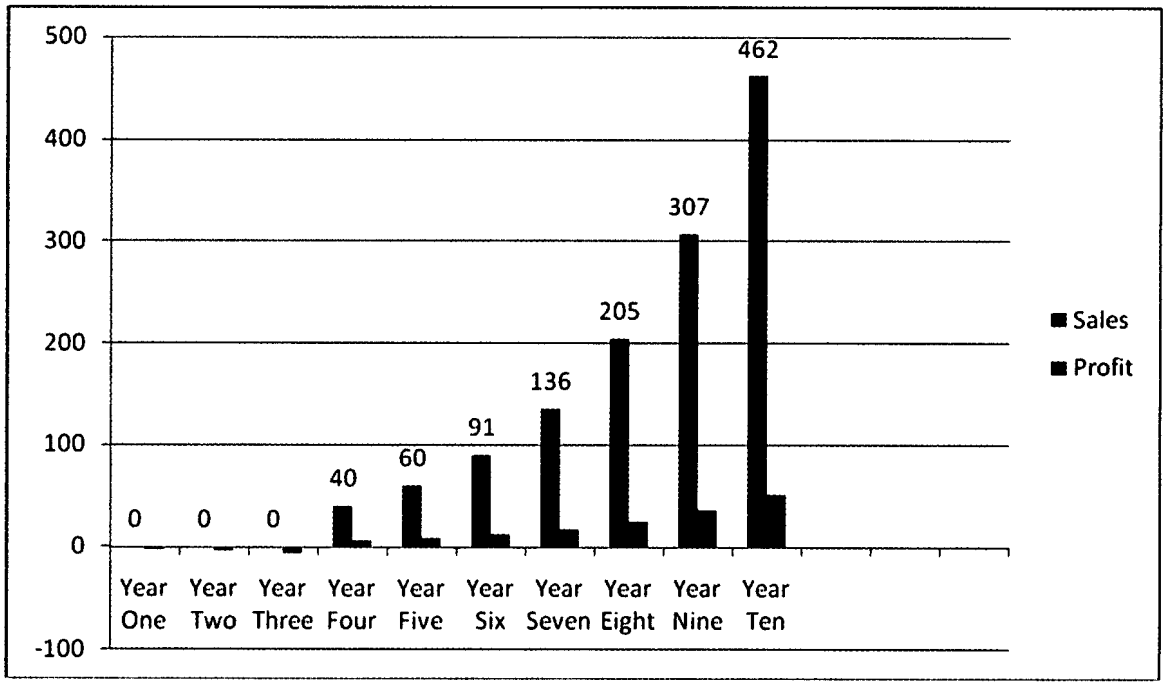
Also, we believe the total ten-year estimated radar market of $40 Billion is very conservative.

We believe the following sales and profit forecast is still conservative. It assumes only a $40 billion total radar market, with a non-US government or US military $27 billion dollar market, but assumes a sales growth rate for our company of 50% per year after year three.

Sales and Profit Forecast assuming 50% growth

Yr	Radar Mkt. (Billions)	Anti-Stealth Sales/Profit (Millions)	Mkt. (%)	Anti-Stealth Services (Sales/Profit)	Total Profit (Mln)	Total Profit Present Value (Millions)
1	2.7	0 / 0	0.00	0 / 0	-2.0	-2.0
2	2.7	0 / 0	0.00	0 / 0	-4.0	-3.6
3	2.7	0 / 0	0.00	0 / 0	-7.0	-5.9
4	2.7	27 / 5.4	1.00	13 / 2.6	8.0	6.3
5	2.7	40 / 8.0	1.48	20 / 4.0	12.0	9.0
6	2.7	61/12.2	2.25	30 / 6.0	18.2	12.8
7	2.7	91 /18.2	3.37	45 / 9.0	27.2	18.1
8	2.7	137 /27.4	5.07	68 /13.6	41.0	25.7
9	2.7	205 /41.0	7.59	102/ 20.4	61.4	36.3
10	2.7	308 /61.6	11.40	154/ 30.8	92.4	51.6
Totals						
	27	**869 /173.8**	**6.4%**	**432/86.4**	**247**	**148.3**

Sales and Net Present Value of Profits Forecast Chart – Millions of Dollars



Six Year Cash Flow Forecast

Yr	Anti-Stealth Sales & Service Revenue (Millions)	Anti-Stealth Expenses (Millions)	Cash (Millions)
1	0	2	(2)
2	0	4	(4)
3	0	7	(7)
4	40	32	8
5	60	48	12
6	91	73	18
Totals (Millions Dollars)	191	166	25

Management Team

Jim Geer, CEO of Anti-Stealth, LLC, has been President of Executive Technologies, Inc., a successful technology and software development company, for twenty-three years.

Current Executive Technologies, Inc. clients include L-3 Titan Corporation, Hill Air Force Base, Picatinny Arsenal, the DoD Document Automation and Production Service (DAPS), US Army Hospital – Landstuhl Germany, the U.S Mineral Management Service, the U.S. Fish and Wildlife Service, University of Texas – Austin, Kern County - California, and the Supreme Court of Florida.

Jim Geer is the inventor of a digital video recorder, US Patent number 6,788,882. This patent, filed in 1998, precedes the key TiVo patents. If you search the USPTO patent database for the term "DVR", you will see that we are the first to use the term "DVR" to refer to a digital video recorder.

Executive Technologies has partnered with Torch Technologies, of Huntsville, Alabama in providing products and services to the DoD. Torch Technologies has also provided consulting relating to the Stealth Radar.

Torch Technologies provides scientific and engineering services to the Department of Defense, specifically the U.S. Army Aviation and Missile Research, Development and Engineering Center, Army Aviation and Missiles Command, Space and Missile Defense Command, Program Executive Office Air, Space, and Missile Defense and the Missile Defense Agency.

Scientific and engineering services provided include weapon system performance analysis including sensors/seekers, aerodynamics, guidance and control, target discrimination, endgame performance, and command and control.

This year, Torch Technologies was recognized by Inc. Magazine as the eighth fastest-growing Defense Contractor in the nation.

Dr. Perry Wheless of the University of Alabama has also consulted on the Stealth Radar.

Competition

Our competitive advantage would be due to several factors.

Our patent is very broad and our patented claims include 21 different techniques for stealth craft detection and ranging. We believe this provides substantial protection from competitors.

Most of these techniques use off-the-shelf hardware, so this should speed our time to market and reduce our R&D costs.

Also, since much of the hardware is off-the–shelf, we can get bids from various manufacturers around the world to procure the hardware, and this competitive bidding should reduce our costs.

Some of our techniques make free use of "illuminators of opportunity" such as commercial television broadcasts, Direct Broadcast satellite TV, WiMax, and weather radar, so this reduces our cost with respect to designs requiring transmitters.

We will also take advantage of developments in Software-defined Radar, in which much of the signal processing is done using software instead of hardware.

If much of the radar processing is performed using software instead of hardware, this would reduce the time and cost of developing Stealth Radar, and let us develop Stealth Radar using the same hardware as traditional radar. The only difference between the two would be in the software.

Software-defined radar builds on the success of Software-defined Radio, which has been widely adopted by the US Military, with Boeing as a lead contractor.

There are several open-source software projects, whereby you can get the software free.

Risks

This should be considered a risky investment. The risks include the following:

Finding and keeping skilled engineers, manager, sales and other employees;

Raising additional monies;

Developing the Anti-Stealth radar;

Developing the Anti-Stealth radar with a practical signal-to-noise ratio;

Competition from much larger radar companies;

Selling the radar at a price point affordable to the targeted market;

Being restricted from selling the radar and radar services to domestic or foreign corporations and to foreign nations, unless the Secrecy Order is revised or rescinded;

Difficulties in raising additional monies because of being restricted from selling the radar and radar services to domestic or foreign corporations and to foreign nations, unless the Secrecy Order is revised or rescinded.

The Threat from Stealth UAVs

There are a growing number of stealth unmanned aerial vehicles being developed and deployed.

China has developed stealth UAVs, as shown in Appendix 6: "The Threat from Chinese Stealth UAVs".

These could be used to attack or threaten military forces, such as those of Taiwan. Or, these stealthy UAVs could be provided by China to Iran or to terrorist groups.

Currently, Iran is seen as more of a threat than China for direct military action against Israel, western countries, and "friendly" Arab regimes, such as Saudi Arabia and Iraq.

Iran has developed its own stealth UAVs. See Appendix 10: "Iran Claims New Stealth Drone That Can Attack US Gulf Fleet."

These stealthy Iranian UAVs could be used to attack the military or ships of foreign countries.

In addition to being labeled by the US as a terrorist state, Iran is thought by many to have close ties to organizations considered as terrorist organizations, such as Hezbollah, and could provide these stealth UAVs to these terrorist organizations. See Appendix 9: "The Threat from Iran."

There are a large number of stealth UAVs being developed in Europe. See Appendix 13: "Stealth is Proliferating – European stealth UAVs." As more European stealth UAVs are made and exported by European countries to second- and third-world countries, there is an increased need for all countries to have radars that can track stealth UAVs.

For example, if India and Pakistan, who are unfriendly to each other, both have stealth UAVs, both countries will also need Stealth Radars to detect and track each other's UAVs.

We believe this will increase the need for our Stealth Radar and increases our marketing prospects.

Also, the more European stealth UAVs that are made, the greater the likelihood that they could become available through the black market to terrorists and enemy states.

There are various estimates for the dollar value and number of UAVs that will be produced in the next ten years.

Teal Group's 2008 market study (11/29/07) forecasts that UAV spending will more than double over the next decade from current worldwide UAV expenditures of $3.4 billion annually to $7.3 billion within a decade, totaling close to $55 billion in the next ten years, with 7,554 (non-mini) UAVs being produced in that timeframe, at an average cost of $4.03 million.

Larry Dickerson of Forecast International (10/21/05) predicts a $13.6 Billion market by 2014 with more than 9,000 UAVs expected to be purchased over this time. These forecasts state that most of the new UAVs being developed are stealthy.

The threat from stealth cruise missiles

There are a growing number of stealth cruise missiles being developed and deployed.

China has developed stealth cruise missiles, as shown in Appendix 5: "The Threat from Chinese Stealth Cruise Missiles."

Also, India has developed stealth cruise missiles, as shown in Appendix 12: "Stealth Proliferation - Indian Stealth Cruise Missile."

Pakistan test-fired a nuclear-capable cruise missile on December 11, 2007, according to the Times of India. The locally developed Babur (Hatf 7) missile has a range of 700 kilometers (440 miles), a ministry spokesman said.

As shown in Appendix 15: "U.S. Cruise Missile Defense Said Possible in 14 months," Jeff Kueter, president of the Washington-based George C. Marshall Institute, said,

"Thousands of cruise missiles are available globally and 20 countries can build them, he said. North Korea fired two short-range missiles from its west coast in July 2007, following a series of long- and short-range missile tests last year."

Also, there is an open-source cruise missile project, whereby a cruise missile can be developed for less than $5,000. The widespread availability of GPS devices and microprocessors along with the information and collaboration provided by the Internet make the proliferation of weapons technologies to rogue countries and terrorist groups more difficult to limit.

We can expect stealthy versions of this missile to be developed as well. See Appendix 14: "The Threat from do-it-yourself Cruise Missiles."

The Teal Group (6/18/07) forecasts 6,099 surface-to-surface (mostly cruise) missiles, in the next ten years, at a value of $9.4 billion, at an average cost of $1.54 million per missile. Many of the new cruise missiles being developed are stealthy.

We believe that as stealth cruise missiles proliferate, more countries will want to procure radars that can track stealth cruise missiles, and this will increase our sales prospects.

The threat from stealth boats - unmanned and manned

China has developed stealth boats, as shown in Appendix 8: "The Threat from Chinese Stealth Boats."

These could be used to attack or threaten military forces, such as those of Taiwan.

Iran has developed stealth boats. See Appendix 11: "Iranian Low Observable Torpedo Boat."

In addition to the threat of used by Iran, Iran could provide these stealth boats to terrorist organizations.

The terrorists could also use a stealthy boat to sneak up to an oil tanker at night and ram the oil tanker, not only sinking the tanker but also causing a massive oil spill and ecological disaster.

As stealth boats proliferate, we believe this will increase the need for and market for our Stealth Radar, and our Stealth Radar services, by both corporations, such as Exxon with it's tankers and off-shore oil platforms, as well as foreign countries.

The threat from Stealth satellites

The Chinese could use their stealth satellites to maneuver near satellites of the UK, Australia, India and other foreign countries and launch a missile to destroy the satellites.

Or, the Chinese could pretend to accidentally ram the satellites, destroying them.

These countries could use our Anti-Stealth Radar to locate these Chinese stealth satellites, and detect if the Chinese satellites were getting too close to their satellites.

There are a growing number of communications, military, and other satellites being launched. For example, the US Navstar GPS satellites (31 satellites), with a $710 million dollar annual cost, have been the preeminent system worldwide.

Now, however, the EU is spending $4.2 billion to develop the Galileo GPS system of 30 satellites, set for 2012 launch.

India is spending $350 million to develop seven satellites for the Indian Regional GPS system, to launch by 2012. Japan is spending $287 million to develop the Quasi Zenith GPS three-satellite system. Russia spends $380 million per year to operate the Glonass GPS system of 17 satellites, launched in 1993.

The detection of Chinese stealth satellites could also be invaluable to corporations who have satellites. For example, News Corp, the parent of Direct TV DBS satellite service, gets billions of dollars of revenue from its satellites, and might have a strong financial interest in being able to see if a Chinese stealth satellite were to get too near one of their satellites.

In addition to selling Stealth Radar, we would provide a radar service, where we would monitor the activity of stealth satellites for our corporate and foreign government clients.

The threat of Chinese stealth satellites tracking military maneuvers

Military services track satellites passing overhead so they can plan their troop movements, attacks and covert actions without being seen by the satellite of an opposing country.

As China and other countries put more stealth satellites in orbit, other foreign countries could use our Stealth Radar to be able to detect their opposing countries stealth satellites, so they can plan the timing of their troop movements, covert actions, etc.

Also, China could use a stealth satellite to track troop movements, and report the troop movements to Iran or a Terrorist group.

Mutually assured destruction to protect satellites

China's test in 2007 of a ground-based anti-satellite weapon in January was a "strategically dislocating" event as significant as the Russian launch of Sputnik in 1957, US Air Force (USAF) Chief of Staff General Michael Moseley said on April 24, as shown in Appendix 7: "Chinese Anti-satellite test prompts US rethink."

In order for the UK, Australia and other foreign countries to protect their satellites from a Chinese ground-based attack, they need the ability to have an effective counter-threat against Chinese stealth satellites, in a Mutually Assured Destruction (MAD) strategy, much as our cold-war MAD strategy countered the Russian nuclear threat.

Thus, foreign countries need our Stealth Radar to be able to detect, locate and range Chinese stealth satellites.

For more background on Stealth satellites, see Appendix 3: "New Stealth Spy Satellite Debated on Capitol Hill."

Also, see Appendix 4: "US Could Shoot Down Euro GPS Satellites If Used By China In Wartime."

This US threat could pressure Europe to deploy more stealth satellites.

Conclusion

We believe there are significant commercial opportunities to sell our Stealth Radar system to foreign countries and both domestic and foreign corporations.

Our Stealth Radar and services are needed by corporations and foreign governments because unobserved stealth craft can pose a threat to these corporations and governments.

These foreign governments and corporations and could acquire our Stealth Radar or they could use our "Radar as a Service" service.

In addition to detecting stealth craft, another market for our Stealth Radar is for incorporation into stealth craft. Stealth craft need to minimize electromagnetic transmissions in order to remain stealthy, so our Stealth Radar is ideal for use in stealth planes, UAVs, cruise missiles, boats, and other stealth craft, because there are no microwave or IR transmissions that could be used to track the stealth craft.

Radar sales over the next ten years is projected to be 9,800 units for $40 billion. This gives an average price per unit of $4.08 million dollars. If we assume the commercial and foreign government (i.e., the non US government or US military) sector of this market comprises 2/3 of the entire market, then this is a $27 billion dollar market.

If we capture just 2% of the $27 billion radar product sales, and our radar service sales are 50% of our radar product sales, then our ten-year sales would be $610 million.

Assuming a 20% profit margin on sales, then our ten-year profit would be $109 million, with a net present value of $65 million.

However, we think we can do better than 2% of radar product sales. If we capture 6% of the radar product sales, and our radar service sales are 50% of our radar product sales, then our ten-year sales would be $1.3 billion.

Assuming a 20% profit margin on sales, then our ten-year profit would be $247 million, with a net present value of $148 million.

Our sales forecast shows that we will start selling Stealth Radar systems and services in year four, and our cash flow forecast shows that we need to raise 13 million dollars during the first three years to fund operations.

Appendices
Appendix 1: Global Radar a $40 Billion Market

Press Release
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FOR IMMEDIATE RELEASE
Global Radar a $40 Billion Market

NEWTOWN, Conn. [Oct. 9, 2006] — Radar will remain a core part of aircraft avionics suites, battlefield command networks, missile defense shields, and air traffic control (ATC) systems over the next 10 years. To meet global demand, Forecast International's "The Market for Radar Systems" study is projecting a $40 billion radar market over the decade reviewed – 2006-2015. This total will encompass the development, procurement, and maintenance of nearly 100 different radar systems over the next 10 years. In terms of unit sales, 9,800 individual radar systems will be procured worldwide during the decade.

Although infrared and electro-optical sensors have become increasing popular, radar remains a vital part of any modern sensor suite. Radar systems are now being tied to overall data-fusion networks on the battlefield and electronic suites in commercial aircraft.

Modern technology will drive radar production, according to William Ostrove, the report's author. "Technology is making active electronically scanned array (AESA) a viable, affordable, attractive alternative to the old dish or more modern phased-array aperture," he said. Ostrove added that many new radar systems over the next 10 years, especially military fire control and surveillance radars, will be dominated by AESA technology.

Northrop Grumman's sales will be dominated by fire control radars such as the APG-68 and APG-81, and by surveillance radars for unmanned aerial vehicles (UAVs) and airborne early warning and control (AEW&C) aircraft such as the E-2 Hawkeye. Raytheon will also enjoy strong sales of fire control radars, in particular its APG-63. Also boosting market share will be sales of the company's SPY-3 naval radar and Volume Search Radar (VSR). Thales, meanwhile, will continue to produce a wide variety of radars for land, sea, and air warfare applications.

Appendix 2: Stealth technology now a real threat to US forces?

2005

Is the threat of stealth adversaries becoming real? For many years the mutterings of the US being attacked by stealth aircraft was half-baked alarmist propaganda and war mongering. But with the rapid proliferation of stealth technology, particularly in Europe, is it finally to the point where the US has to seriously consider the likelihood of facing stealth threats in future military operations within the 5-10 years timeframe –i.e. well within the lifecycle of current procurement programs.

For many years the US has operated safe in the knowledge that they do not face an immediate threat from stealth technology. There was no serious concern that the Iraqi's would use stealth aircraft to counterattack in either GW1 or 2. Similarly the Taliban's stealth capabilities (zero) did not enter into the equation during the invasion of Afghanistan. Even Serbia, who arguably represented the most technically competent of the US's adversaries were not thought to have stealth.

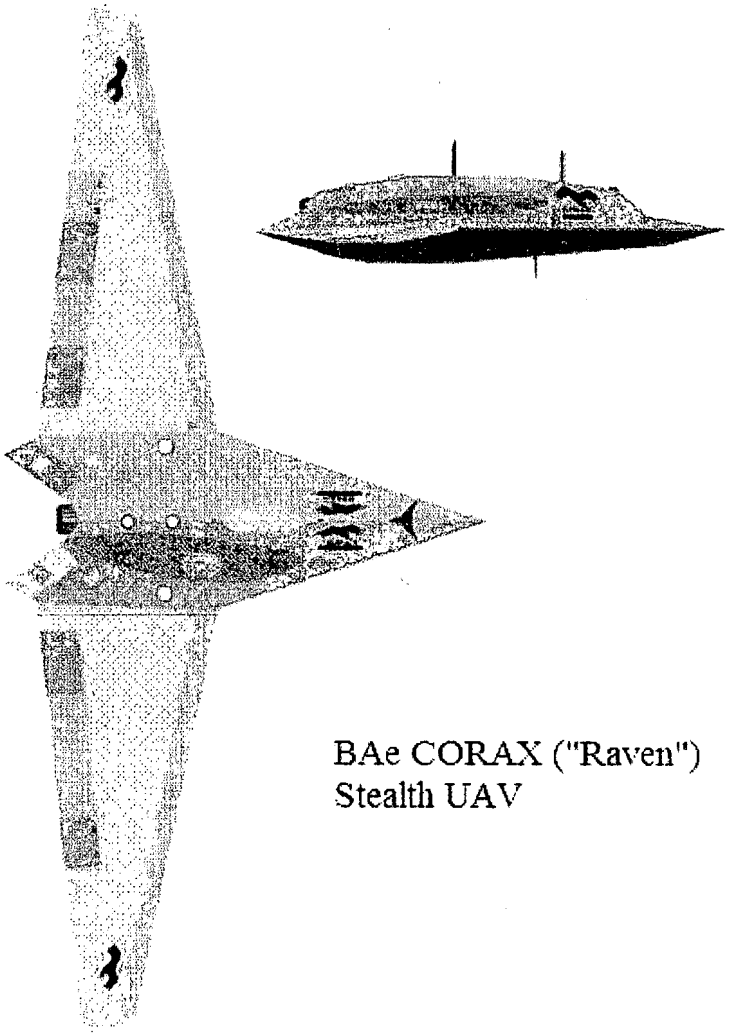
But developments in Europe have demonstrated that stealth technology is no longer the sole preserve of the US. And the fact that much of the recent developments have been conducted with a high degree of secrecy reminds us that there could be more stealth out there than is immediately apparent. If the UK, Sweden, France and almost certainly Germany can produce stealth air vehicles, then can we seriously doubt that the Israelis, Russians or even South Africans cannot?

I am not for a moment suggesting that Western European nations are about to attack the US, nor that an enemy having a few stealth air vehicles is likely to turn the scales in their favor against the might of the USA (although nuclear weapons make certain match-ups moot). But there is similarly no doubt that an enemy equipped with stealth air vehicles has a credible means of inflicting very serious losses on the US in a conventional war.

The risk as I see it is exports to and propagation of the technology in ever less reliable nations. Europe needs to export its stealth technology which currently centers on UAV and UCAV designs. India, Taiwan, South Korea, Australia, South Africa, Israel, United Arab Emirates, Singapore, Poland, Hungary, Saudi Arabia, Greece, Czech Republic... the list of believable export customers for European stealth manufacturers goes on. Given the increasing reliance on exports that European manufacturers require, it would be likely that the upper-tier export customers (above) could get their hands on the technology before it is even deployed operationally with the home air forces –as can be seen with Eurofighter production prioritization.

The US is already planning to export stealth technology in the form of the F-35 and to a lesser extent the Global Hawk. With European UCAV/UAV designs on the market this trend can only increase –if the US refuses to export the current crop of UCAVs then it leaves the market wide open for European domination and would turn the tide on America's strong position as an high-grade arms exporter. The time is near when America can no longer afford to maintain a two-tier export strategy, keeping the most advanced systems for home use.

It seems commonsensical that if the US maintains its current interventionist activities, that in the comparatively near term future US forces will face attack from stealthy UCAVs and Cruise missiles.



BAe CORAX ("Raven")
Stealth UAV

Appendix 3: New Stealth Spy Satellite Debated On Hill

By Dana Priest

Washington Post Staff Writer

Saturday, December 11, 2004; Page A01

The United States is building a new generation of spy satellites designed to orbit undetected, in a highly classified program that has provoked opposition in closed congressional sessions where lawmakers have questioned its necessity and rapidly escalating price, according to U.S. officials.

The previously undisclosed effort has almost doubled in projected cost -- from $5 billion to nearly $9.5 billion, officials said. The National Reconnaissance Office, which manages spy satellite programs, has already spent hundreds of millions of dollars on the program, officials said.

The stealth satellite, which would probably become the largest single-item expenditure in the $40 billion intelligence budget, is to be launched in the next five years and is meant to replace an existing stealth satellite, according to officials. Non-stealth satellites can be tracked and their orbits can be predicted, allowing countries to attempt to hide weapons or troop movements on the ground when they are overhead.

Stealth technology has been used to cloak military aircraft such as the F-117A fighter and the B-2 bomber.

When radar searches for a stealth craft, it records a signature that is much smaller than its size should indicate. Thus a stealth plane or satellite could appear to radar analysts as airborne debris.

Advanced nations routinely patrol the skies with radar and other equipment to detect spy planes, satellites and other sensors.

About 95 percent of spycraft are detected by other nations, experts say. But "even France and Russia would have a hard time figuring out what they were tracking" if they were to pick up the image of a stealth satellite, said John Pike of GlobalSecurity.org, an expert on space imagery.

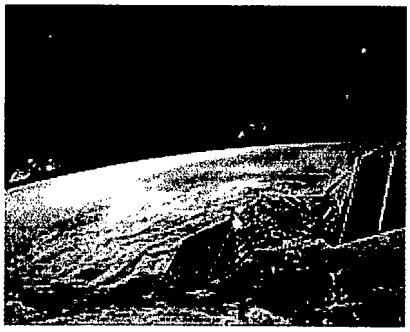
The idea behind a stealth satellite is "so the evildoers wouldn't know we are looking at them," Pike said. "It's just a fundamental principle of operational security that you know when the other guy's satellites are going to be overhead and you plan accordingly."

But, Pike said, "the cover and deception going on today is more systematic and continual. It's not the 'duck and cover' of the Soviet era."

The existence of the maiden stealth satellite launched under the Misty program was first reported by Jeffrey T. Richelson in his 2001 book "The Wizards of Langley: Inside the CIA's Directorate of Science and Technology." Richelson said that first craft was launched from the space shuttle Atlantis on March 1, 1990.

Researcher Julie Tate contributed to this report.

Appendix 4: US Could Shoot Down Euro GPS Satellites If Used By China In Wartime: Report



Galileo, a constellation of 30 satellites and ground stations due to go into operation in 2008, is being launched by the European Union and the European Space Agency to tap into a growing market of global satellite positioning.

London (AFP) Oct 24, 2004

The United States could attack Europe's planned network of global positioning satellites if it was used by a hostile power such as China, The Business weekly reported Sunday.

Galileo, a constellation of 30 satellites and ground stations due to go into operation in 2008, is being launched by the European Union and the European Space Agency to tap into a growing market of global satellite positioning.

China last month became a partner in the Galileo program, which could help provide services such as communications for the 2008 Beijing Olympics but also has applications for strategic military use.

According to a leaked US Air Force document written in August and obtained by The Business, Peter Teets, under-secretary of the US Air Force wrote: "What will we do 10 years from now when American lives are put at risk because an adversary chooses to leverage the global positioning system of perhaps the Galileo constellation to attack American forces with precision?"

The paper also reported a disagreement between EU and US officials this month over Galileo at a London conference which led to the threat to blow up the future satellites.

The European delegates reportedly said they would not turn off or jam signals from their satellites, even if they were used in a war with the United States.

A senior European delegate at the London conference said his US counterparts reacted to the EU position "calmly".

"They made it clear that they would attempt what they called reversible action, but, if necessary, they would use irreversible action," the official was quoted as saying. Washington has long expressed doubts about Galileo, which could compete with its Global Positioning System (GPS), although the transatlantic feud was reportedly ended following an agreement signed in June.

US officials have voiced fears that the rival system, which has also brought on board Russia and Israel in addition to China, could compromise US and NATO military operations which rely on GPS for navigation and combatant location and might also interfere with a classified Pentagon positioning system known as M-Code.

At one point, Washington suggested that Galileo was an unnecessary rival to GPS that merely duplicated the US system.

Analysts said the US threat to Galileo's future system exposed the true military value of the global navigation systems.

Previously, officials touted only the commercial benefit of Galileo, which is expected to tap into a burgeoning market for satellite positioning systems that doubled from 10 billion euros in 2002 to 20 billion euros in 2003. Brussels has also argued Galileo will create 150,000 new jobs across the European bloc.

The Business warned in an editorial that technological choices - Galileo versus GPS - now would fuel more international political division.

"Technological decisions required by Galileo mean countries have to commit themselves to the ugly delineation of the Iraq War: pro-America (GPS) or anti-America (Galileo)."

It warned that Britain, Washington's staunchest ally in the Iraq war, would once again find itself trapped between the two camps - and that as a result "the Anglo-American alliance is quietly splitting behind the scenes".

The Threat from China

Appendix 5: The Threat from Chinese Stealth Cruise Missiles

China is developing low observable technology for its cruise missiles.

Seek Optics Technical Co. Ltd. has developed materials which can be used to make cruise missiles as well as aircraft, tanks and warships more stealthy. The material named SF18, which can be used on cruise missiles, reportedly "absorbs radiation in the 2GHz-18GHz band. The reflex loss of the material reaches -10dB and their relative absorption ration exceeds 60%." In addition, plans for China to use the Russian GLONASS satellite-based global positioning system may enable China to improve the accuracy of its cruise missiles without relying on the US GPS system.

[Zhang Yihong, "Beijing develops new radar-absorbing materials," *Jane's Defense Weekly,* 24 February 1999, p.3]

Appendix 6: The Threat from Chinese UAVs

From Wikipedia, the free encyclopedia

The WZ-2000, also known as the WuZhen-2000 and previously the WZ-9 is a multi-purpose stealth UAV developed by Guizhou Aviation Industry Group (GAIC) in the People's Republic of China.

Development on the WZ-2000 began in 1999. A mock up of the WZ-2000 was publicly displayed at the 2000 Zhuhai Airshow, with a more accurate model on display at the 2002 event. First flight was on December 26, 2003, and there is sketchy news that an improved version, possibly designated the WZ-2000B, was due to fly at the end of 2005.

The UAV is powered by a single WS-11 turbofan engine which sits on top of the empennage between the two V-shaped tail fins. The fins are canted at approximately 40°. The sensor package includes thermal imaging camera, synthetic aperture radar, with images transmitted via a satellite communications antenna in the nose bulge.
[edit] Specifications

This aircraft article is missing some (or all) of its specifications. If you have a source, you can help Wikipedia by adding them.
General characteristics

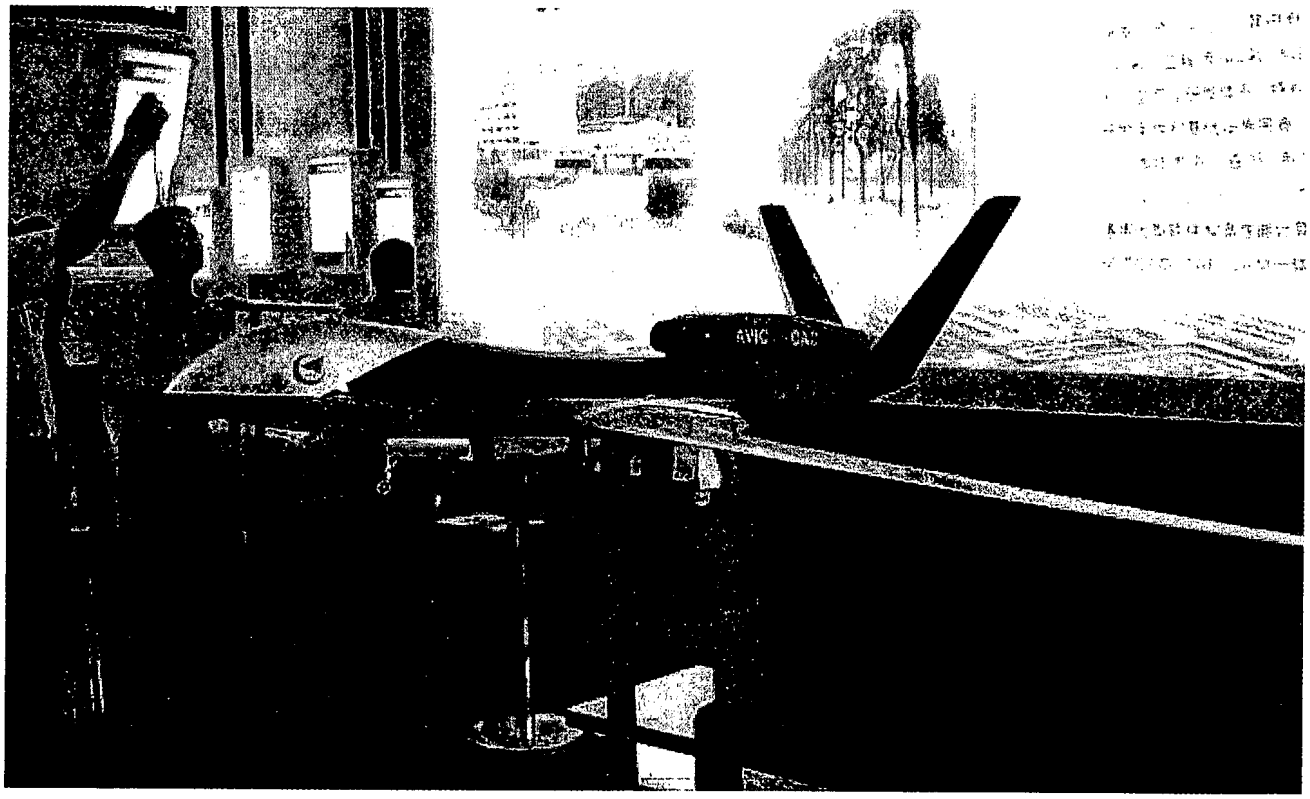
- Payload: 80 kg (176 lb)
- Length: 7.5 m (24 ft 7 in)
- Wingspan: 9.8 m (32 ft 2 in)
- Height: ()
- Max takeoff weight: 1,700 kg (3,740 lb)
- Powerplant: 1× WS-11 turbofan

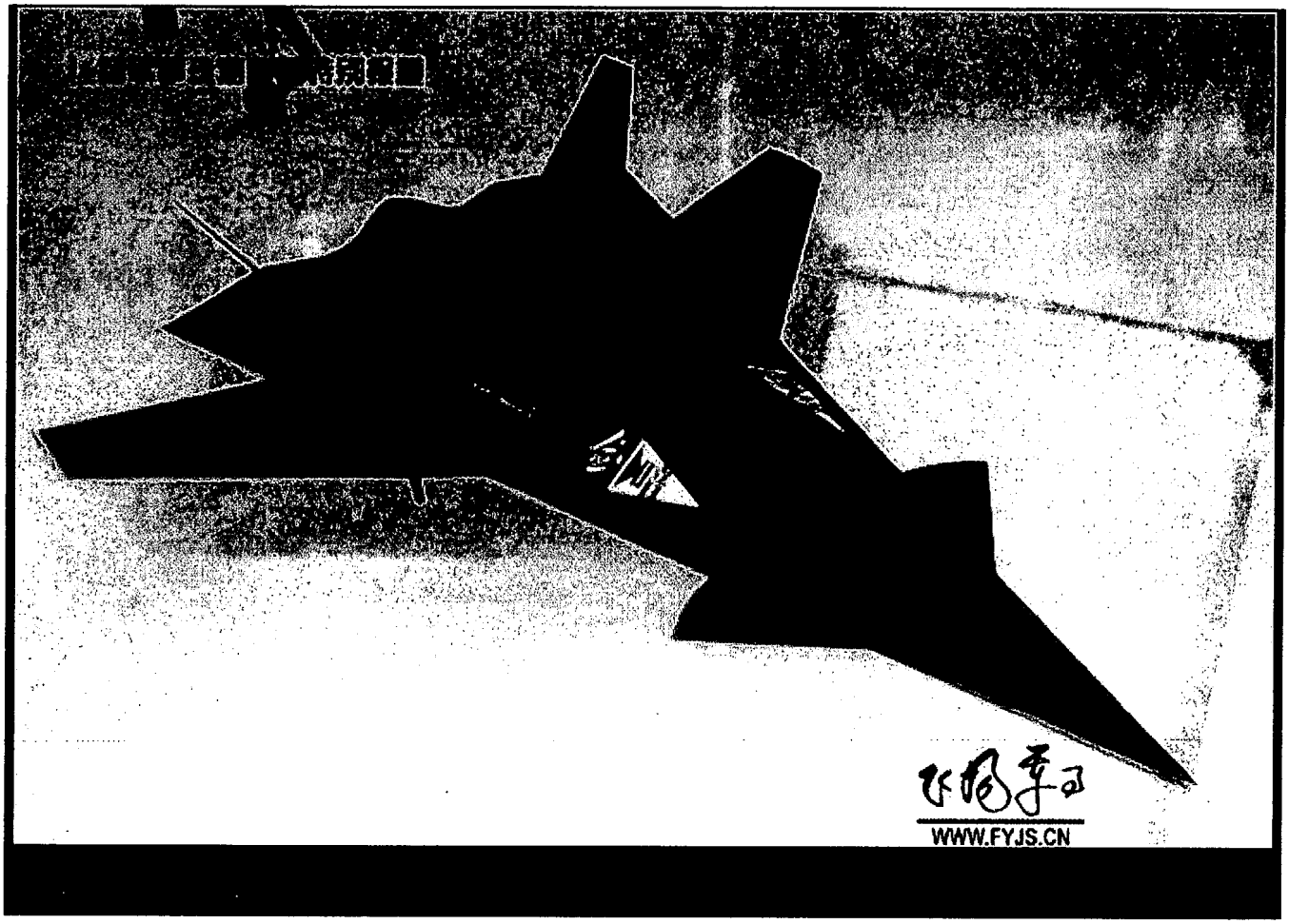
Performance

- Maximum speed: 800 km/h (432 knots, 497 mph)
- Range: 2,400 km (1,300 nm, 1,490 mi)
- Service ceiling: 18,000m (59,000 ft)
- Endurance: 3 hours

[edit] References

- Info and image from *Chinese Defense Today*
- Info and an image

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Appendix 7: Chinese Anti-Satellite test prompts US rethink

30 April 2007

China's test of an anti-satellite weapon in January was a "strategically dislocating" event as significant as the Russian launch of Sputnik in 1957, US Air Force (USAF) Chief of Staff General Michael Moseley said on 24 April.

Gen Moseley said it had spurred the USAF to evaluate its defensive options in outer space and added that the strategic stakes are higher than ever in outer space.

The vulnerability of commercial and military satellites of the US and its allies is now on display after China destroyed an old Chinese weather satellite in January using an anti-satellite weapon, said the general.

Gen Moseley highlighted the potential magnitude of the threat, saying that an attack on another nation's satellite would provide a legitimate casus belli. "I would say killing another nation's satellite is an act of war; it's no different than sinking a ship or killing an airplane," he said.

Of particular concern to Gen Moseley was that China's recent anti-satellite weapon test - which was preceded by three earlier failed attempts - was a direct ascent shot fired from a land-based mobile system. Such systems are a concern because they are difficult for other nations to target.

Appendix 8: The threat from Chinese Stealth Boats

China Naval Modernization: Implications for U.S.

Navy Capabilities — Background and Issues for Congress

November 18, 2005

Ronald O'Rourke, Specialist in National Defense, Foreign Affairs, Defense, and Trade Division

New Class Of Fast Attack Craft.

China in 2004 introduced a new type of ASCMarmed fast attack craft built on a stealthy, wave-piercing, catamaran hull that is one of the more advanced hull designs used by any navy in the world today. Observers believe the hull design is based on a design developed by a firm in Australia.

Surface Combatants. One observer states that by 2010, China's surface combatant force could exceed 31 destroyers and 50 frigates, backed up by 30 ocean-capable stealthy fast attack craft. Such a force could then be used in conjunction with submarines and attack aircraft to impose a naval blockade around Taiwan.

Surface ships could also defend the airspace around Taiwan from U.S. Naval forces, especially its P-3 anti-submarine warfare aircraft which would play a critical role in defeating a blockade.

Appendix 9: The Threat from Iran

Iran Builds Rockets to Arm Hezbollah, Deter Sanctions

By Charles Goldsmith, Judy Mathewson and Jonathan Ferziger

Aug. 4 2006 (Bloomberg) -- Many of the rockets Hezbollah is firing into Israel are made in Iran, demonstrating the Islamic republic's success in copying Chinese and Russian technology to build its own weapons industry.

The Shiite Muslim group's arsenal includes Iranian-built portable Katyusha rockets, Israeli Reserve Brigadier General Yossi Kuperwasser said. Hezbollah struck an Israeli ship on July 14 with an Iranian-made C802 Noor guided missile. The militia also has Iran's Zelzal rocket, with a range of 120 miles, enough to reach Tel Aviv from south Lebanon, said Yaakov Amidror, a retired major general who ran Israel's National Defense College.

The conflict, which began three weeks ago, provides the first test for Iranian-made weaponry, giving the country an opportunity to show it can retaliate if attacked. The fighting comes as Iran faces the threat of economic sanctions if it doesn't accept United Nations Security Council trade incentives to stop its nuclear program by the end of this month.

"The success of Hezbollah reflects well on the regime in Iran" in military terms, said David Schenker, a senior fellow at the Washington Institute for Near East Policy. ``It adds a deterrent in terms of making the West think twice about putting damaging economic sanctions against Iran, and it will make people in the West think twice about the military option."

To supply Hezbollah, Iran flies arms to Syria, where they're loaded on trucks and shipped into Lebanon under Syrian supervision, said Yiftah Shapir, editor of the "Middle East Military Balance," an annual survey published by Tel Aviv University's Jaffee Center for Strategic Studies.

Homegrown Arms Industry

Since the start of the conflict, Hezbollah has hit Israel with about 2,300 rockets, Israel's army said today. Forty-one Israeli soldiers and 27 civilians have died in the fighting, which has wounded 610 people, including 457 civilians, it said.

The Muslim militia, designated a terrorist organization by the U.S. and Israel, captured two Israeli soldiers on July 12, sparking the hostilities. Israeli attacks have killed more than 900 people and injured 3,000, Lebanese Prime Minister Fouad Siniora said yesterday.

Iran developed its homegrown arms industry in response to shortages experienced during its 1980-1988 war with Iraq, said Vali Nasr, an Iran expert at the Naval Postgraduate School in Monterey, California.

With Saddam Hussein sidelined, Iran has "every intention of becoming a major regional power," William Cohen, secretary of defense under U.S. President Bill Clinton, said in an interview in Washington. ``They've been testing a variety of missiles," said Cohen, a former Republican senator from Maine who founded the Cohen Group, a Washington-based lobbying and consulting firm.

Earthquake Missile

Iran no longer relies on imports from China, Russia and North Korea for its weapons, said Guy Ben-Ari, a fellow at the Center for Strategic and International Studies in Washington. Instead, state aerospace and defense industries are copying and even improving on those countries' technologies, he said.

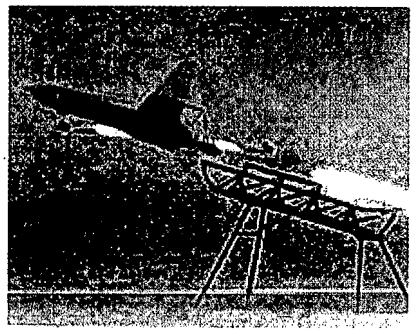
"The Iranians are at a stage now where they can build most of these weapons themselves locally,"' Ben-Ari said. There have been sightings of Iranian military air transports landing at Syria's main airport in Damascus, he said.

Many of the rockets Hezbollah is firing into Israel are made in Iran, demonstrating the Islamic republic's success in copying Chinese and Russian technology to build its own weapons industry.

The Shiite Muslim group's arsenal includes Iranian-built portable Katyusha rockets, Israeli Reserve Brigadier General Yossi Kuperwasser said. The militia also has Iran's Zelzal rocket, with a range of 120 miles, enough to reach Tel Aviv from south Lebanon, said Yaakov Amidror.

The conflict, which began three weeks ago, provides the first test for Iranian-made weaponry, giving the country an opportunity to show it can retaliate if attacked. To supply Hezbollah, Iran flies arms to Syria, where they're loaded on trucks and shipped into Lebanon under Syrian supervision.

Appendix 10: Iran Claims New Stealth Drone That Can Attack US Gulf Fleet



File photo of an Iranian UAV.

by Staff Writers

SpaceWar.com

Tehran (AFP) Feb 10, 2007

Iran said on Saturday it has started mass producing and using a stealth drone with a range of 700 kilometres (420 miles) that it claims is undetectable to radars. "We have built a drone with a more than 700-kilometre range which can collect information and shoot films," the head of the elite Revolutionary Guards, General Yahya Rahim Safavi, told Iran's Arabic-language satellite news channel Al-Alam.

I

"The material and the shape of this drone make it undetectable for radars, so it can not be targeted," he added.

"The drone has passed its experimental phase and it is being mass produced, and we are currently using it in our operations," Rahim Safavi, said without giving more details.

His announcement comes a few days after troops under his command successfully tested a land-to-sea missile with a range of about 350 kilometres (210 miles) and a new Russian-made air defence missile system.

Iranian leaders have repeatedly said the Islamic republic's armed forces are ready for any eventuality in the current standoff with the West over its nuclear programme.
Although the United States has said it wants the standoff resolved through diplomacy, Washington has never ruled out military action to thwart Iran's atomic drive.

The United States accuses Iran of seeking a nuclear weapon. Tehran vehemently denies the charges, insisting its atomic programme is peaceful in nature.
earlier related report

Iran warns 'suicide drones' can hit US navy

Tehran (AFP) Feb 11 - Iran has built "suicide" drones capable of attacking US naval ships and forcing them to leave Gulf waters, the semi-official news agency Mehr quoted a Revolutionary Guards commander as saying Sunday.

"We have built birds without passengers (drones) that can carry out suicide operations on the US Navy, at any depth if necessary, to make them leave the region in disgrace," said Ali Shoushtari, deputy commander of the Guards' land forces.

Warning about a "defeat for the enemy", Shoushtari said: "Americans know that if they confront the Islamic system, they wil not be secure in the region or at home."
Iran's supreme leader Ayatollah Ali Khamenei on Thursday vowed to hit back at US interests worldwide if it attacked the Islamic republic to thwart its nuclear programme.

In response, the White House said it has no plans to invade Iran, and downplayed the significance of reinforcing the US military presence in the Gulf region.

Iranian leaders have repeatedly said the country's armed forces are ready for any eventuality in the current standoff with the West over its nuclear activities.

The United States accuses Iran of seeking a nuclear weapon. Tehran vehemently denies the charges, insisting its atomic programme is peaceful in nature.
Source: Agence France-Presse

From Wikipedia, the free encyclopedia

Shahbal	
Type	Unmanned Aerial Vehicle
Manufacturer	Shahbal Group, Sharif University of Technology
Maiden flight	2006
Status	In development

Shahbal is an unmanned aerial vehicle (UAV) designed by a group of aerospace engineers at Sharif University of Technology.

Design and development

Shahbal was designed by the team of three newly-graduated aerospace engineers of Sharif University of Technology, Alireza Abbasi, Amirreza Kosari and Mohammad Rahim.

Originating from a national competition, Shahbal was first designed to fulfill the contest requirements. Right at the beginning stages, the development team expanded their goals. Shahbal was awarded the Best Design Prize during the first National UAV Design Competition (NUDC-2006) of Iran and was awarded as a top-ranked vehicle after passing all the flight tests planned for the contest.[*citation needed*]
[edit] Technical design

Shahbal is a close-range multi-role UAV and is well-designed for surveillance/reconnaissance missions, along with patrols, pilot trainings and suicide attack. The structure is mainly composites and with a small radar cross section (RCS), Shahbal is able to complete its missions very close to the enemy radars. The twin tail configuration empowers Shahbal of high sharp and fast maneuvers in both civil and military applications. Control is both in manual (radio control) and autopilot (GPS/INS) mode. The autopilot used is a MP2000 of MicroPilot; also Shahbal is designed to fulfill nap-of-the-earth maneuvers such as terrain following and terrain avoidance. The landing gear mechanism is a fix tricycle plus an arresting hook.

Powerplant is a 4.5 hp ZDZ engine installed as pusher, at the end of main body. Mission payloads are depending on the type of mission, and range from small cameras and

telemetry systems to heavy munitions and weapons. Maximum payload weight is 5.5 kg (12 lb).

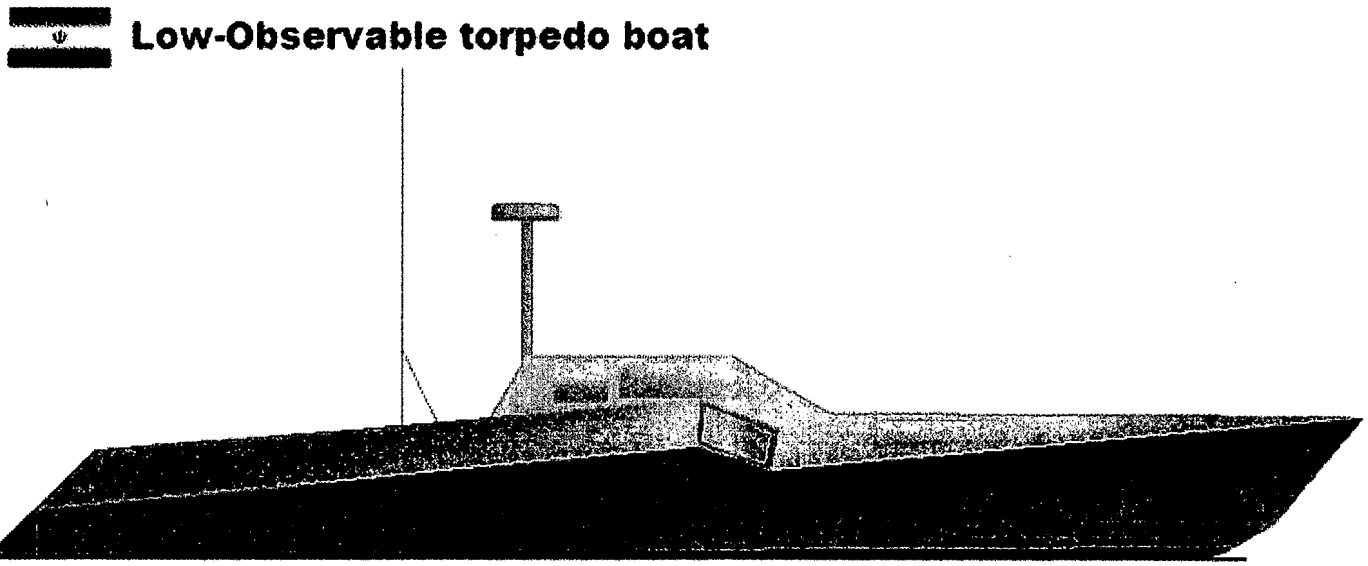
[edit] Specifications

This aircraft article is missing some (or all) of its specifications. If you have a source, you can help Wikipedia by adding them.

General characteristics
- Crew: Unmanned
- Length: 2.05 m (8 ft 1 in)
- Wingspan: 2.47 m (6 ft 8 in)
- Empty weight: 9.5 kg (21 lb)
- Gross weight: 17.5 kg (38 lb)

Performance
- Maximum speed: 180 km/h (112 mph)
- Cruising speed: 130 km/h (81 mph)
- Range: 12 km (7.5 miles)
- Service ceiling: 3000 m (4,500 ft)
- Rate of climb: 5 m/s (985 ft/min)

Appendix 11: -Iranian – Low Observable torpedo boat



Number in service: At least 5.

Armament (anti-ship): 2 x 21" torpedoes or, potentially but not likely, 2 x Shkval rocket torpedoes

Armament (other): Possibly machine guns, unguided.

Although a lot of evidence of these boats exists, both on Google-Earth and in press photos of the Iranian navy, very little if anything is known in the public domain, at least going by my internet research. The hull shape is clearly designed to be stealthy with facetted lines which deflect radar waves away from the boat. The shallow angle of the twin silos and lack of fire control radars suggests that this boat carries torpedoes not missiles and is probably designed to launch them from within visual range. Whilst Iran is known to have the Russian design Shkval rocket torpedo which travels at 200kts (about 5 times faster than a conventional torpedo) and has a range of 7km, I think it is unlikely that it will have been incorporated into these boats yet. However, if it were the combination of Shkval and stealthy launch platform would make these craft the most potent anti-ship weapon in Iran's navy.

Iran Test-Fires Another 'Top Secret' Missile

Wednesday, April 05, 2006
Associated Press

.... Also, On Tuesday, state TV also said the Revolutionary Guards had tested what it called a "super-modern flying boat" capable of evading radar.

The report showed the boat, looking like an aircraft, taking off from the sea and flying low over the water.

Appendix 12: Stealth Proliferation - Indian Supersonic Stealth Cruise Missile

Volume 18 - Issue 13, Jun. 23 - Jul. 06, 2001
India's National Magazine
from the publishers of THE HINDU

On 12 June 2001, the Indo-Russian joint venture, BrahMos (stands for Brahmaputra-Moskva) Co, successfully test fired a supersonic cruise missile code-named PJ-10. It is a state-of-the-art weapon system and can strike warships at 300 kms in 300 seconds, can mount multiple war-heads, and use stealth properties making it virtually undetectable; it is the only supersonic cruise in existence.

The Indian Navy's capabilities will be greatly augmented after this missile is inducted into service. The PJ-10 will threaten the Harpoon-armed Pakistani warships and the Moskit-equipped Chinese naval vessels. The "seeker" system of the missile, however, is yet to be tested by the Indian Defence Research and Development Organization (DRDO).

The conventional missile, which the Americans used against Iraqi targets in Operation Desert Storm and are currently using against the Taliban and Al Qaida in Afghanistan, is a subsonic missile. Its lethality derives from its unique guidance system. Unlike the PJ-10, which is publicized as a "fire and forget" weapon, the US cruise missile uses an onboard computer along with digital terrain-matching maps for navigation. This makes it extremely maneuverable since it can be guided even through windows and around buildings to strike targets.

A ballistic missile, once launched, is subject to atmospheric effects and the antics of "hackers" who can interfere with its preset navigational gyro by altering the parameters of the software in the controlling onboard computer. Only the United States possesses digital terrain maps. We may be having the know-how, but do we have the resources to acquire satellite imagery on such a vast scale?

Notwithstanding this hurdle, the PJ-10 can be employed effectively by the three services, though it is was basically meant for the Indian (and Russian) Navy as a "sea-skimming" weapon to target hostile ships. The Argentinean Air Force used such missiles with great effect when they sank British shipping with an air-launched version of the French Exocet missiles.

The nuclear submarine project has been underway for a long time. A future Mark of the PJ-10 has been factored into its design. An undersea launch platform (like the US Polaris nuclear submarine) which is difficult to track and engage is the answer to a first-strike strategic posture of Pakistan. A nuclear submarine equipped with a PJ nuclear cruise missile should be our second strike deterrent in a Sino-Indian conflict.

India thinks the Chakra nuclear submarine, the cryogenic rocket engine, and now the PJ-10, are ways to get around American embargos and sanctions in the post-Pokharan period. It would have taken India at least ten years to test-fire the cruise on our own. With Russian

collaboration India has done it in just under four. Therefore, some Indians think it is possible for India to become one of the sophisticated weapon exporting countries in a decade's time. The Russians are short of cash and are willing to use military hardware exports for raising funds. Indians have the wherewithal to do this with the PJ-10 which has indigenous internal guidance and software.

Appendix 13: Stealth is Proliferating - European stealth UAVs

Although many spectators seem fixated with the US weaponized Predator programs (though somewhat ignorant of the US Excalibur program), European manufacturers are catching up very fast having demonstrated their ability to produce low observable technology.

Many of the programs are inter-related, particularly with Dassault's *Neuron* program, but for the sake of simplicity I think we should deal with them as airframes. Hence:

1. BAE Systems Corex ("Raven"), UK
2. BAE Systems
3. EADS Barracuda, Germany (/Europe)
4. Saab SHARC, Sweden
5. Saab FILUR, Sweden
6. Dassault "Little Duke", France
7. Alenia Sky-X, Italy

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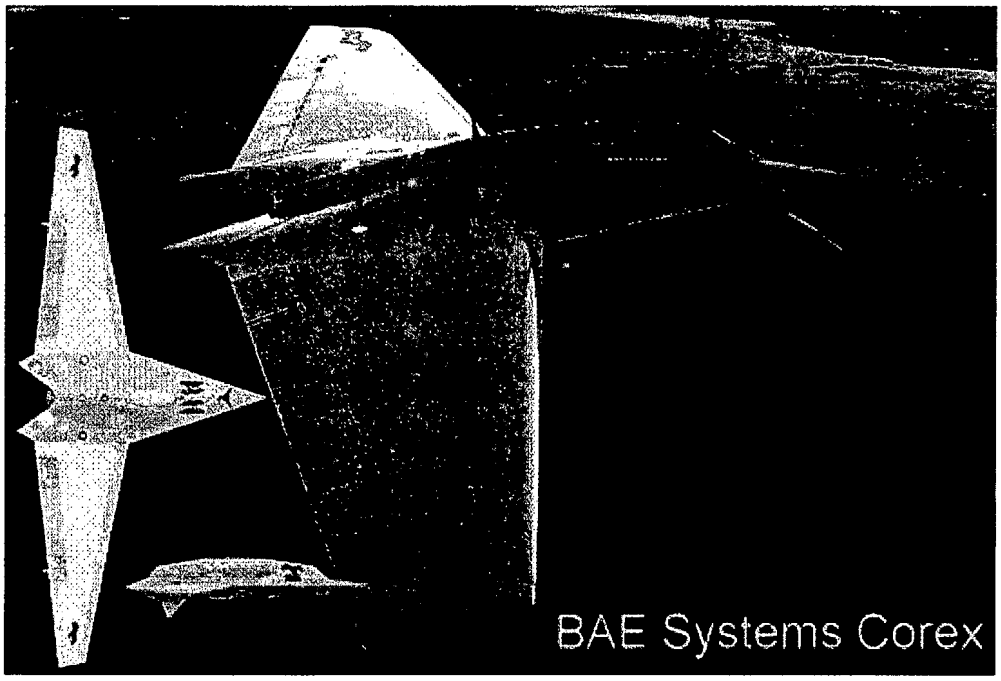
1. BAE System Corex (Latin for Raven), UK
First flown: 2004(?)
Role: Technology Demonstrator for low observables technology.
Description: An apparently large flying wing UAV resembling the defunct Darkstar program in layout. The fuselage has a generic stealthy appearance with air intake for the single (small) turbofan above the nose. The wings are long and less stealthy appearing with bulky control surface actuators. The wing form is typical of high altitude, low speed long endurance platforms leading to speculation that the design is most likely related to a Global Hawk type role. However, the project is also consistently associated with UCAV applications –which leads to several possibilities:
a) A medium or high altitude long endurance platform fulfilling a similar role to weaponized Predator in which case internally carried Brimstone missiles would be a likely choice.
b) A medium or high altitude stand-off bomber carrying Storm Shadow cruise missiles or other PGMs.
c) A more J-UCAS like interdictor platform to replace the Tornado in which case a completely different wing plan would be required.



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2. BAE Systems Eclipse, UK
First flown: 2000(?)
Role: Experimental
Description: A small experimental aircraft designed in collaboration with Cranfield University. Although it is in the scale of a hobbiest's remote controlled plane it featured several key low-observable technologies including a "flapless" configuration. This project is often overlooked by observers. The project is continuing under the banner FLAVIIR.

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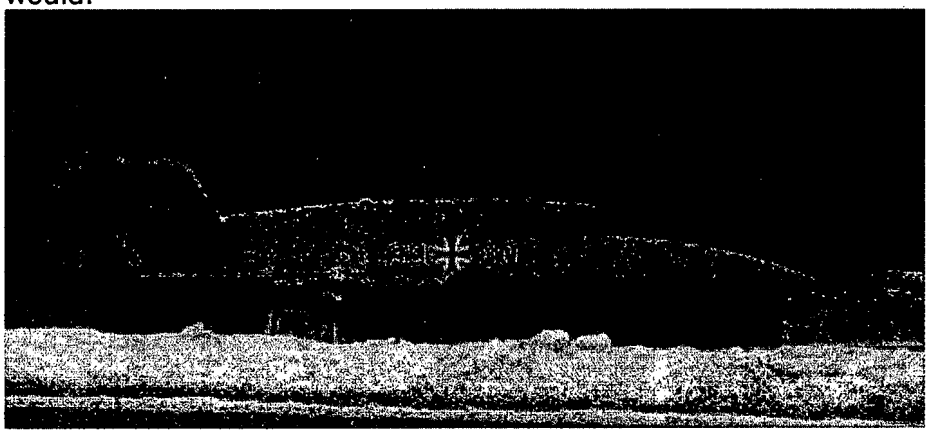
3. EADS Barracuda, Germany (/Spain/Europe)
First flown: 2006(?)
Role: Technology demonstrator
Description: A simple low-observable layout with blended lines which appear to be optimized for forward angle stealth. The wing plan seems in keeping with an interdictor role –perhaps a replacement for the Tornado IDS and F-18. The fixed inlet without splitter appears to point towards subsonic flight characteristics. The airframe

does not appear to have a weapons bay but any production design presumably would.



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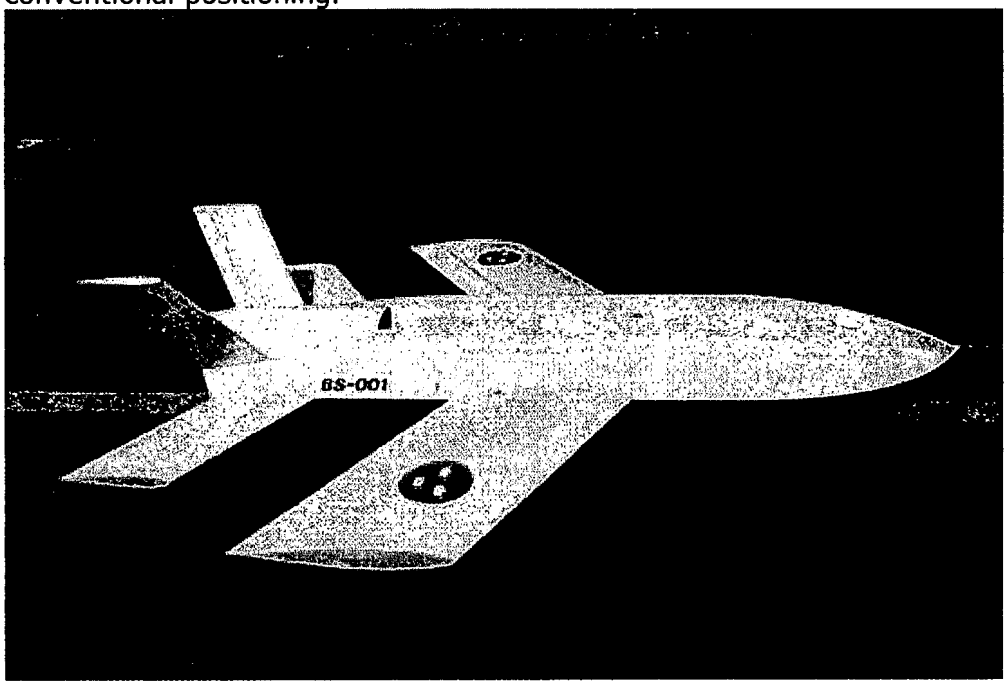
4. Saab SHARC, Sweden
First Flown: 2002
Role: Experimental(?)
Description: A small UAV which appears to have inherently stealthy configuration which would not be a natural layout if stealth was not a priority. This air vehicle appears to have been superceded by the FILUR program (see below). Note that the tail fins are of essentially similar design to those of the EADS Barracuda and Alenia Sky-X. Other common themes running through the European UCAV programs are the above fuselage air intake position which is inherently more stealthy than more conventional positioning.



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5. Saab FILUR, Sweden
First flown: 2005
Role: technology demonstrator
Description: An advanced aerodynamic configuration reminiscent of the J-UCAS designs, the air vehicle is thought to be part of Sweden's contribution to the Neuron

program. In a retrograde step compared to the SHARC, the FILUR demonstrator appears to have fixed landing gear –reminding us that it is merely a demonstrator. It also features unusual inward canted tail fins, whereas the Neuron is expected to be tailless.

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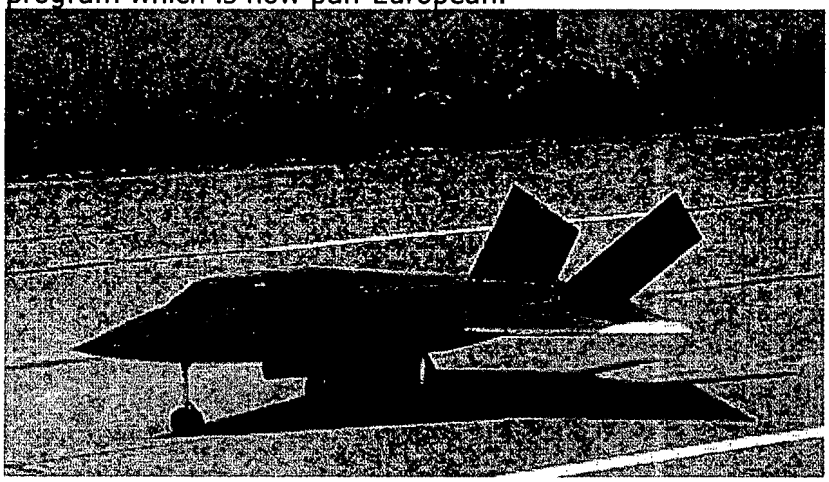
6. Dassault *Petit Duc* ("Little Duke"), France
First flown: 2000
Role: Technology demonstrator
Description: Probably the first European stealth aircraft to fly (at least publicly), the Little Duke is a small twin jet powered design which has led to the Dassault Neuron program which is now pan-European.



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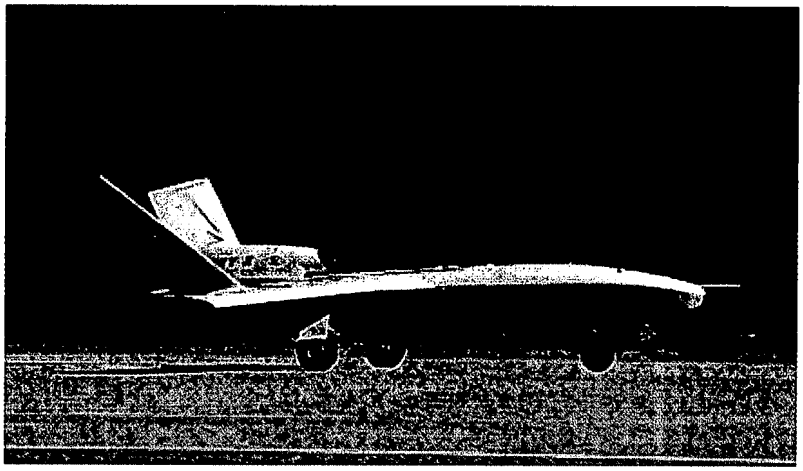
7. Alenia Sky-X, Italy
First flown: 2005
Role: Technology demonstrator
Description: another program linked to the Neuron project, the Sky-X demonstrator is quite large with an overall size similar to the EADS Barracuda and more typical of a military trainer. It appears to feature an internal weapons bay although the payload is quoted at just 200kg. The aerodynamic configuration resembles the Boeing X-32 JSF in that it has sloping sides and high set wing. But the air intake, which in itself does not appear stealthy, is mounted on top of the airframe.



[edit on 13-2-2006 by planeman]

Appendix 14: The threat from do-it-yourself cruise missiles

The $5,000 do-it-yourself Cruise missile. How long before a stealth version is produced?

`It Is Surprisingly Simple'

Newsweek Web Exclusive

Simpson, 49, a New Zealand Internet publisher and jet-engine consultant, is assembling a cruise missile--the same type of weapon used by U.S. forces to help win the war against Saddam Hussein earlier this year--in his garage and documenting his progress online (interestingprojects.com).

He says he's trying to show governments how easy it would be for terrorists to build the low-cost but lethal missile so that they will put more effort towards preventing such an attack.

It'd be easy to dismiss him, as the FBI and Department of Defense apparently did when he contacted them initially with his concerns, if he weren't well on his way to completing the missile and for less than $5,000.

Why build a cruise missile?

It was a follow up to an article I wrote over a year ago [on my Web site] in which I presented the possibility that, given improvements in today's off-the-shelf technology, almost anyone could build their own cruise missile that could be quite effective against soft targets on U.S. soil--soft targets meaning, basically, any nonmilitary installation.

Most people agreed, but there were a number of people who claimed I was overstating the case and that it's not possible to build a real cruise missile without access to sophisticated gear, specialist tools and information not readily available outside the military. So, in order to prove my case, I decided to put my money where my mouth is and build a cruise missile in my own garage, on a budget of just $5,000. I had to make some modifications for that price. It's got a limited range, but it's at least 100 miles, a limited payload of 10 kilograms and limited accuracy of about 100 yards.

How hard was it to get all the components?

That's one of the issues. Everything flies under the radar of authority. The components are innocuous and pose no threat. It's only when you assemble them do you have a problem. You can't ban kitchen knives just because a few people use them to stab someone. They have found more positive uses than negative ones for these components like GPS systems. It was far easier than I thought to collect and import all these components, actually. I got quite a bit of the stuff from eBay and others from normal retailers. It took three weeks and I think the initial purchasing cost me about $1,100 U.S. I should get into the arms business.

Speaking of which, aren't you concerned that would-be terrorists or arms dealers might get ideas from your site?

I think it's one of those things that people who want to build such a device already have access to such information. My publishing is not going to motivate them if they are already motivated to perform some evil act. This kind of information has been culled over for many years in many places. I mean Encyclopedia Americana gives a recipe for gun powder. Information itself is not a threat. It is what people choose to do with that information.

The United States has considered the cruise missile the gem in the crown. Every major military action recently has been involving cruise missiles.

Isn't there anything besides raising public awareness that can be done to prevent criminals from building a cruise missile?

Not really. There are already millions of GPS systems out there and when you restrict the sales of them, then people who want them just steal them from those who already have them.

Wouldn't someone draw attention with a missile that size if they tried to transport it?
The key criteria of the missile has been easily transported and launched. I can take it apart and put it in the back of my pickup and reassemble and launch it from a ramp on the back of my truck. I plan to drive through [the New Zealand city of] Auckland with a cruise missile in the back of my truck unassembled but covered to prove you could transport it through a highly populated city (or be proven wrong).

But why go through the trouble of building a missile if you could buy one on the black market?

I think the answer is that there is a much greater chance of being caught if they are buying a weapon as proven [last] Tuesday [when alleged British arms smuggler Hemant Lakhani was arrested].

We would imagine there are many more arms smugglers out there to fill his shoes.

Appendix 15: U.S. cruise missile defense said possible in 14 months

By Andrea Shalal-Esa

TUESDAY, JULY 10, 2007

WASHINGTON (Reuters) - The United States could deploy a system to protect an area ranging from Washington to Boston from sea-based cruise-missile attacks within 14 months at a cost of "several billion dollars," a top Lockheed Martin Corp. executive said on Monday.

David Kier, who formerly was deputy director of the National Reconnaissance Office, said the technologies needed to track, identify and destroy any such missiles launched from ships off the U.S. coastline already existed or were under development.

"It just requires a will to do it," he told congressional aides at a briefing.

Subsonic cruise missiles are not difficult to destroy, Kier said. But it is essential to track them quickly, as they can reach a target within 11 minutes, and to destroy them over water to avoid damage from the debris, he added.

Lockheed has long lobbied for a program to defend against cruise missiles and short-range ballistic missiles, a market valued by some analysts at upwards of $10 billion.

Short-range cruise missiles are easy to hide, relatively cheap, and can carry a variety of warheads such as biological or chemical weapons, according to some experts.

The company had high hopes for its $148 million High Altitude Airship program, for airships priced at just under $40 million apiece that can hover and monitor a 500-square-mile area for about two months.

But the Pentagon's Missile Defense Agency cut the program's budget sharply in fiscal year 2007 and requested no funding at all for 2008. Lockheed convinced lawmakers to reinstate the 2007 funds, and there is an amendment to provide a small sum in 2008, but the program's outlook is grim at this point.

Christopher Bolkcom, defense specialist at the Congressional Research Service, said cruise missiles were difficult to track and that Lockheed's forecast about deploying a wide-area defense was "optimistic."

"It's sort of like border security. You can put some useful measures in place, but you can never afford a fool-proof system," he said.

Bolkcom said U.S. policymakers had likely done "the mental calculus that it's too expensive, too hard, on the one hand, and the threat is not big enough to justify it, on the other."

Another speaker at the briefing, Jeff Kueter, president of the Washington-based George C. Marshall Institute, underscored the urgency of the threat.

Tens of thousands of cruise missiles are available globally and 20 countries can build them, he said. North Korea fired up to two short-range missiles from its west coast last month, following a series of long- and short-range missile tests last year.

He called for greater efforts to defend against cruise missiles, which he said were becoming the "weapons of choice" for potential competitor states and terrorist groups.

Cruise missiles were first fired at U.S. troops during the war in Iraq. But the United States itself, with 12,000 miles of coastline, provides ample targets for extremist groups, especially since cruise missiles can be easily be stowed inside a standard cargo container.

The U.S. military has plans to protect troops, ships and overseas bases from cruise missile attacks, but it has no plan and no budget to protect the U.S. coastline, Kueter said.

Lockheed's Kier said the United States needed an integrated plan to guard against attacks by cruise missiles, ballistic missiles and other manned and unmanned aircraft.

Some platforms on which Stealth Radar could be mounded

Appendix 16: Blimp 25 Times Larger than Goodyear

To blanket hundreds of miles with high-resolution radar, the 450-ft.-long, unmanned High Altitude Airship will use old-fashioned lifting gas to ascend. A top-mounted solar array may enable this massive radar platform to stay aloft for up to a month.

Designer: Lockheed Martin

Operational Alt.: Up to 60,000 ft.

Speed: 28 mph (cruising)

Progress: The airship's radar system is still being developed, but Lockheed is scheduled to fly a full-size prototype of the ship by the end of 2009. The Missile Defense Agency is a potential user.

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800-758-5804, ext. 534163 D

Electronics & Surveillance Systems-Akron, a unit of Lockheed Martin, with its partners — Stratcom International and others—have developed an unmanned lighter-than-air vehicle that would operate above the jet stream and above severe weather in a geostationary position to serve as a telecommunications relay, a weather observer, or a peacekeeper from its over-the-horizon perch.

According to the North American Aerospace Defense Command (NORAD), 11 high-altitude airships would provide overlapping radar coverage of all maritime and southern border approaches to the continental U.S., and may be a significant asset in homeland defense efforts. The Stratospheric Platform System (SPS) dirigible operates just barely within the outer limits of the earth's atmosphere and is emerging as part of the military's 21st century transformational mindset.

SPS is an unmanned, powered airship that can maintain a relatively geostationary position at 70,000 feet. Lift is provided by helium that is contained in its envelope. Differential thrust, electric-powered props control the pitch and roll and keep it in position. With the advent of thin-film photovoltaic solar cells (capable of producing voltage when exposed to radiant light), commercially available fuel cells, and lightweight/high-strength fabrics, a high-altitude airship could stay on station weeks or even months at a time by generating its own power and keeping helium loss to a minimal amount.

On station, the onboard sensors' surveillance coverage extends over the horizon and monitors a diametric surface area of 775 miles. At nearly 500 feet long and 150 feet in diameter at its widest girth, the airship's volume exceeds 5 million cubic feet.

This updated concept of a tried and proven technology takes lighter-than-air vehicles beyond the surface exclamations of: "Look, there's the Goodyear blimp." As a matter of fact, the Akron, Ohio, Lockheed Martin business unit supports the tire company's blimp fleet as the FAA certificated manufacturer and maintenance provider.

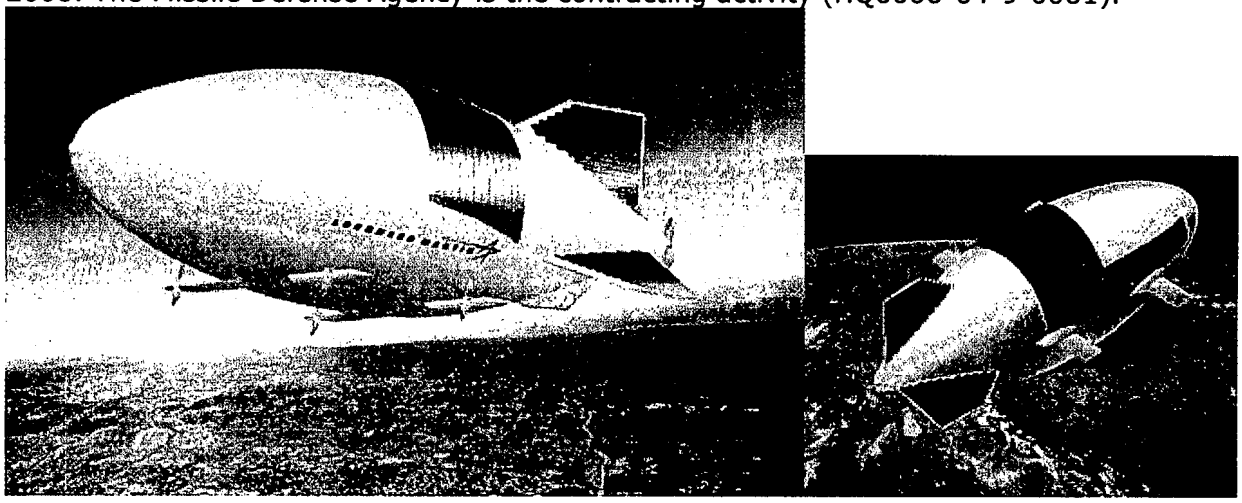
Now, though, things have changed. Lighter-than-air vehicles operating at altitudes of 21 kilometers (70,000 feet) are nearing a reality thanks in large measure to the technical savvy of Lockheed Martin NE&SS-Akron and the convictions of Stratcom President Lt. Gen. James Abrahamson, USAF (retired), and other members of its stratospheric airship industrial team.

Maintaining geostationary position over long periods requires a detailed understanding of the environment at 21 km.

The North American Aerospace Defense (NORAD) has asked for funding to build a prototype high-altitude airship, with the idea of stationing 10 ships to cover all the continental borders of the United States.

On 29 September 2003 Lockheed Martin Naval Electronics & Surveillance Systems, Akron, Ohio, was awarded agreement HQ0006-04-9-0001 for design and risk reduction phase 2 of the High Altitude Airship advanced concept technology demonstration. The objective of this Phase 2 effort is to continue design (through critical design review) and technical risk reduction efforts for a high-altitude airship system prototype that will demonstrate military utility by operating in the stratosphere as a long-endurance, quasi-geostationary platform with a contractor-supplied, government-approved payload or a government-supplied payload. The estimated total value for Phase 2 is $40,000,000 with a period of performance from October 2003 to June 2004.

There is an option for a prototype, development, build and demonstration Phase 3 for an estimated total value of $50,000,000 with a period of performance from June 2004 to July 2006 and a follow-on option for an Extended User Evaluation Period Phase 4 for an estimated total value of $9,000,000 with a period of performance from August 2006 to July 2008. The Missile Defense Agency is the contracting activity (HQ0006-04-9-0001).



Here's another possible platform for Stealth Radar.

Appendix 17 - Integrated Structure is the Sensor (ISIS) and ISAT

ISIS is a large blimp that floats at 70,000 feet, in which the structure of the blimp is an AESA phased-array antenna.

The active electronically scanned array (AESA) antenna would be bonded to the hull of an unmanned airship 150 to 300 meters (164 to 328 yards) in length that could hover for long periods above the jet stream at altitudes of 65,000 to 70,000 feet. The antenna would transmit on UHF and X-band. Raytheon Space and Airborne Systems (SAS) is a leader in AESA technology, which uses no moving parts to scan at nearly the speed of light.

Such a radar system would be parked in the sky 24 hours a day, 365 days a year. It would need no refueling, or the elaborate logistics support that manned aircraft require.

The system will be a large antenna in the sky, in the form of an airship. Unlike other airborne antennas systems, where the antenna is the payload, the airship itself would act as one large antenna.

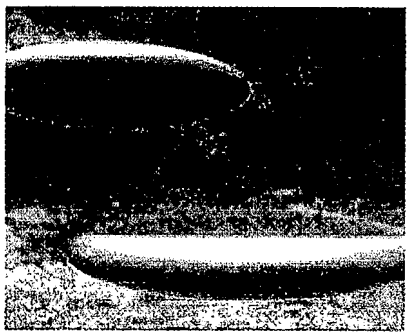
ISIS would be ideal for a "look down" Stealth Radar to detect and range stealth boats, stealth cruise missiles and stealth UAVs.

ISIS would also be ideal for a "look up" Stealth Radar to detect stealth satellites. In addition to the large antenna size, the blimp is above much of the denser parts of the earth's atmosphere and water vapor. This makes millimeter and infrared wavelengths more feasible, since they have trouble penetrating the denser parts of the earth's atmosphere and water vapor.

Also, colder operating environments can improve the signal-to-noise ratio within the radar itself.

The antenna is the airship itself

DARPA Asks Raytheon To Develop Radar For Integrated Sensor Is Structure Program



Although it would contain "millions of electronic

components," the thickness of the antenna as envisioned by Raytheon would be about one centimeter (0.4 inch).

by Staff Writers

El Segundo CA (SPX) Aug 15, 2006

A radar antenna the length of a football field that would weigh less than the 22 players in action on it is in development by Raytheon Company under terms of an $8 million contract associated with the Integrated Sensor is Structure or ISIS program from the Defense Advanced Research Projects Agency (DARPA).

The active electronically scanned array (AESA) antenna would be bonded to the hull of an unmanned airship 150 to 300 meters (164 to 328 yards) in length that could hover for long periods above the jet stream at altitudes of 65,000 to 70,000 feet. The antenna would transmit on UHF and X-band. Raytheon Space and Airborne Systems (SAS) is a leader in AESA technology, which uses no moving parts to scan at nearly the speed of light.

Picture an airborne radar that is capable of truly persistent wide area surveillance—a radar that can pinpoint the direction, speed and patterns of activity on the ground and in the air.

Such a radar system would be parked in the sky 24 hours a day, 365 days a year. It would need no refueling, or the elaborate logistics support that manned aircraft require.

The system will be a large antenna in the sky, in the form of an airship. Unlike other airborne antennas systems, where the antenna is the payload, the airship itself would act as one large antenna. It is called Integrated Sensor Is the Structure (ISIS).

For space, near-space (airship) and even ground-based applications, in principle it's possible to have very large antennas, according to Joseph Guerci, acting director of the DARPA Special Projects Office.

To increase radio frequency (RF) capability of antennas, the conventional method is to increase the power of the system. Another method is to deploy very large antennas. A confluence of technological advances has been made in the area of low-power transmit/receive modules, including lightweight, efficient materials amenable to deployable structures.

"The airship is a very large structure, but the air is so thin at around 65,000 to 70,000 feet that there is not much ability to carry a heavy radar or heavy antennas for other telecommunications," explained Guerci. "But what if you could turn that large structure into an antenna?"

It would also boast a 600-kilometer radar horizon at a 70,000-foot operational altitude.

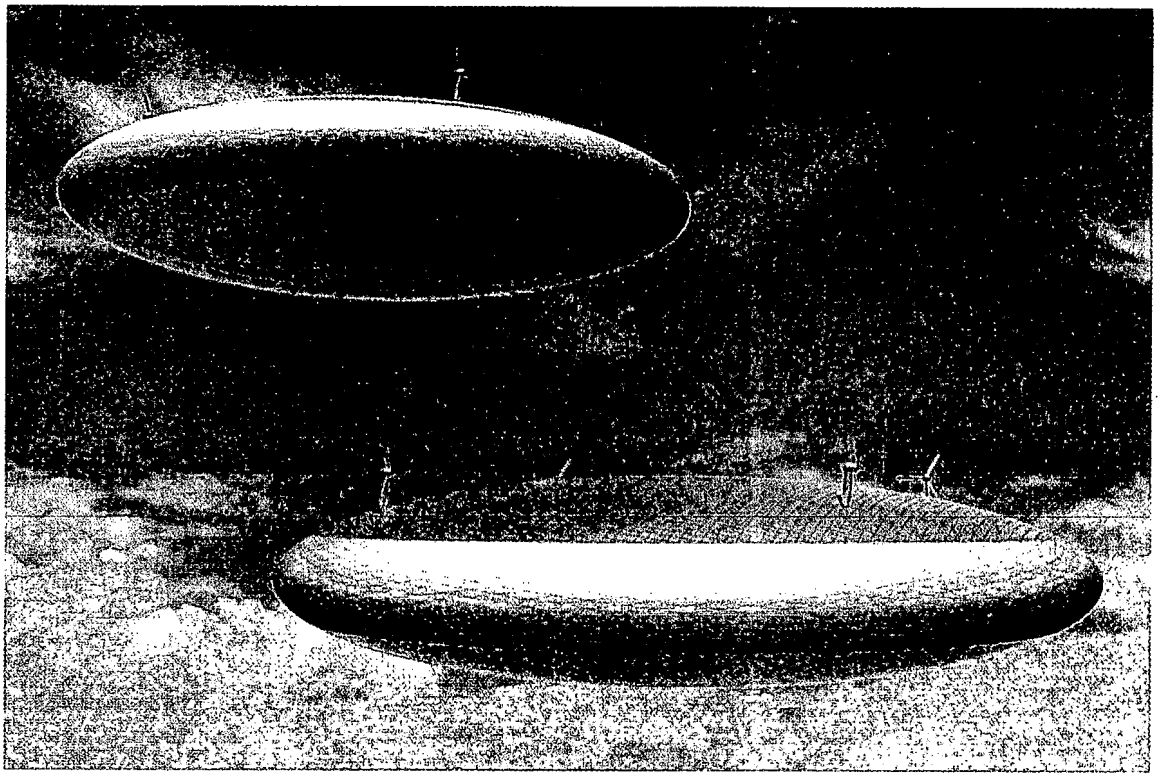
For surveillance from space, there is the Innovative Space Radar Antenna Technology (ISAT) program. DARPA is looking at a potential launch in 2010 on the Air force's STP2 launch vehicle.

ISAT will be a 300-meter-long antenna in space, which can be folded up and stowed in a single launch vehicle.

Both ISIS and ISAT are made possible by a new class of light-weight, low-power-density, active, electronically steered array antennas (AESA).

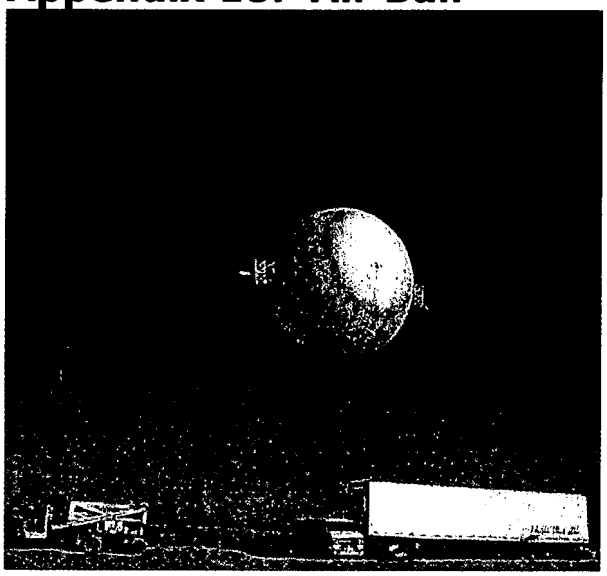
Also, there is a Missile Defense Agency high-altitude, long-loiter (HALL) airship under development, which could carry an antenna. But the payload size is limited.

"What we're saying is we need to make the antenna the airship itself. So we take a completely different design philosophy," Guerci said.



Another platform for mounting Stealth Radar

Appendix 18: Air Ball



21st Century Airships Inc. has developed a fully autonomous UAV airship, which can be optionally manned.

http://www.21stcenturyairships.com

Our airships can be transported in a standard trailor or cargo container and assembled for flying within 24 hours of arriving at destination. (016)

High Altitude Airships and UAVs

UAVs (Unmanned Aerial Vehicles), having a broad range of military and civil applications, are a rapidly growing industry throughout the world. They range from tiny, insect-size flying objects, to jet-airplanes and helicopters.

It is a medium altitude (up to 20,000-ft.), long-duration platform, suitable for a multitude of applications. Powered by a hybrid-electric propulsion system, it can reach speeds up to 60 knots with a duration of up to 72 hours.

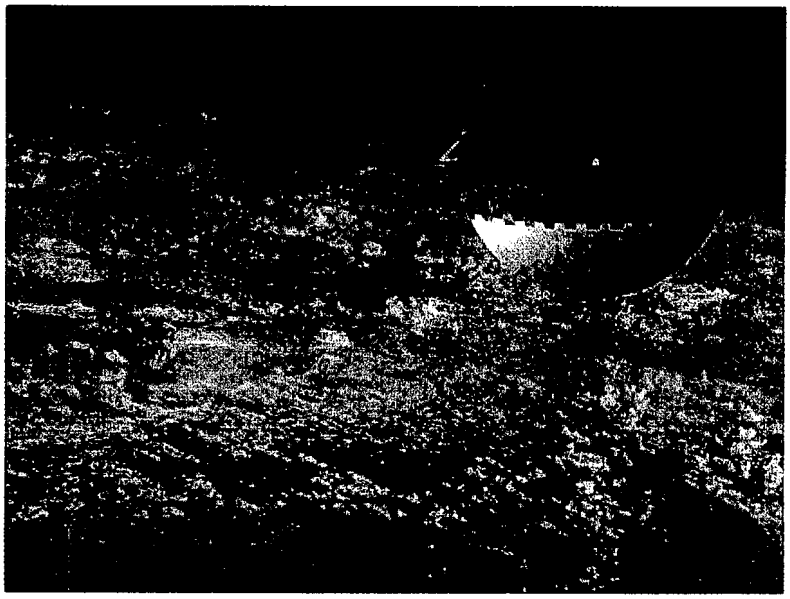
Flight demonstrations are scheduled to begin in late 2007.

21st Century Airships Inc. continues its lengthy involvement with high-altitude airships. It is one of only a few companies that have moved beyond the concept stage and into the air. In June 2003' during a 12-hour test flight, our company set the absolute altitude world record for helium filled airships.

(http://records.fai.org/airships/current.asp?id1=ba&id3=1&id2=1)

The next stage of the development will be a series of test-flights reaching an altitude of 40,000-ft.

Ultimately these UAVs will be "parked" in the stratosphere at an altitude of approximately 20-km (65,000-ft.). At that altitude, they will serve as a stable platform for telecommunications and remote sensing.



Appendix 19: Open-Source Software-defined Radar

If much of the radar processing is in software instead of hardware, this would reduce the time and cost of developing Stealth Radar, and let us develop Anti-Stealth Radar using the same hardware as traditional radar. The difference would be in the software.

Software-defined radar builds on the success of Software-defined Radio, which has been widely adopted by the US Military, with Boeing as a lead contractor.

There are several open-source software projects, whereby you can get the software free, such as GNU Radio, at http://gnuradio.org/trac/wiki

The Rising Importance of FPGA Technology in Software-defined Radio

By Angsuman Rudra, Interactive Circuits and Systems
2007

FPGAs are now an essential component of Software Radio due to their flexibility and real-time processing capabilities. But they can also be used in phased array radar beamformers.

Software-defined radio has become immensely popular among engineers tackling a wide variety of applications. The U.S. military's Joint Tactical Radio System provided the needed impetus for its widespread adoption and software radio is now being designed in radar and other wireless applications requiring adaptive modulation and coding, space-time coding, beamforming and interoperability.

Software-defined radio (SDR) has thus created a paradigm shift, moving radio applications from the analog domain to a domain where the majority of functions are implemented digitally. This has been made possible by the advent of high-speed, high-resolution Analog-to-Digital Converters (ADCs), Digital-to-Analog Converters (DACs) and high-performance DSP-technology Field Programmable Gate Arrays (FPGAs) that are now competing with traditional DSPs. In fact, FPGAs have enabled software radios to be used in phased array radar beamforming, wireless smart antenna and spectrum monitoring applications.

FPGA or DSP?

Digital signal processing has traditionally been at the heart of SDR, and the function can be accomplished using a range of hardware solutions: application-specific integrated circuits (ASICs), purpose-designed digital signal processors and general-purpose processors. Another shift in DSP technology is now taking place, which is transforming the SDR market.

FPGAs have evolved from being flexible logic design platforms to signal processing engines.

FPGAs are now an essential component of software radio for their flexibility and real-time processing capabilities. Increasingly, system designers are porting more and more signal processing functionalities to FPGAs. The flexibility of having the ability to integrate logic design with signal processing is pushing designers to replace traditional DSPs with FPGAs.

FPGAs are inherently suited for very high-speed parallel multiply and accumulate functions.

Current generation FPGAs can perform an 18 x 18 multiplication operation at speeds in excess of 200 MHz. This makes FPGAs an ideal platform for operations such as Fast Fourier Transform (FFT), Finite Impulse Response (FIR) filters, Digital Down Converters (DDC), Digital Up Converters (DUC), correlators, pulse compression (for radar processing), etc. It does not imply, however, that all DSP functionalities may be implemented in FPGAs.

Floating-point operations are extremely difficult to implement in FPGAs due to the large amount of real estate needed in the device. Also, processing involving matrix inversion (or division) is also more suited in a DSP/GPP platform. Thus FPGAs and DSP will co-exist for a long time.

Phased Array Radar Beamformer

An example of such an approach might be the application for beamforming for phased array radar. Phased array radars with a large number of elements are becoming extremely common for next-generation radar systems. These systems must handle high bandwidth and thus pass a large amount of data back and forth, and the challenge is to build a synchronized system with synchronization between multiple DDCs and high-speed data transfer between modules.

To enable a solution to be developed in the shortest time and at the lowest cost, ICS developed and delivered a prototype system that implements a 2 x 2 beamformer at 40 and 20 MHz bandwidths.

Two ICS-554 105 MHz/channel (maximum sampling frequency) analog input boards are used to acquire four analog channels. For the 20 MHz bandwidth case, each ICS-554 generates four partial beams, of which two are sent to the other ICS-554. Each ICS-554 generates two full beams by combining two partial beams generated internally with two partial beams received from the other ICS-554.

The data transfer between boards is 200 Mbytes/s in each direction for a total of 400 Mbytes/s over low voltage transistor-to-transistor logic (LVTTL). As bandwidths and channel count increase, the data rate will also increase. Thus at 40 MHz bandwidth, the data rate is 400 Mbytes/s in each direction (for a total of 800 Mbytes/s).

This high data transfer is best done from FPGA to FPGA. Larger beamforming may be very easily implemented on the ICS-572 platform, which offers a much larger FPGA (up to eight million gates) and large on-board memory.

Interactive Circuits and Systems
www.ics-ltd.com

Appendix 20: Infrared

"Advances in electro-optics sensor technology will impact the market with both significant improvements to the war fighter and reductions in cost and maintainability. Two drivers will be uncooled IR sensors and flash ladar. In the short term, uncooled IR sensors enable long-wave IR sensing at room temperature using vanadium oxide and MEMS technology. Elimination of the cooling reduces systems size, weight, power, and costs. Cooled IR sensors will always exhibit superior sensitivity. Flash ladar creates high-resolution 3D images that enable robust target detection and identification with minimum collateral damage."

Above from 6/16/03 Electronic Design

More compact and less expensive IR sensors make the optional use of IR, as opposed to Microwave, which is discussed in our Stealth Patent, more viable.

Appendix 21: Lightweight AESA Phased Array Radar

New Technology includes advanced RF sensors, including technologies to produce very large, stowable, lightweight, low-power phased-array radars."

Above from 6/16/03 Electronic Design

Phased Array technology plays a major part in our Stealth Radar vision. These new large low-power phased-array radars make our technology more compact and affordable, and more suitable to being incorporated into UAVs, blimps and the various other Stealth Radar platforms.

Appendix 22: Techniques for Narrow Beamwidths

For some of our Stealth Radar techniques, narrow transmit or receive beamswidths are preferred, to provide better resolution and signal-to-noise ratios.

According to the radar equation, larger antennas are one way to create narrow beamwidths.

Shorter wavelengths, such as X band, are another way to create narrow beamwidths.

Doppler Beam Sharpening (DBS)

Doppler Beam Sharpening is a "super resolution" technique to get finer resolution than the beamwidth. The F-18 fighter's APG-73 radar specs list a 67-1 DBS ratio for DBS mode operation.

Digital Beamforming (DBF)

Digital beamforming is the most advanced approach to phased array antenna pattern control. When implemented at the array element level, DBF enables full utilization of the maximum number of degrees of freedom in the array. This can lead to significant improvements in beamforming of simultaneous multiple independent beams, adaptive pattern nulling, space-time adaptive processing (STAP), and direction finding (DF), compared to traditional analog array control techniques.

Interferometric array

Borrowing the idea of astronomers of using an array of radio or optical telescopes to obtain the resolution of one large telescope or antenna, we could use antennas on two or more craft to get the resolution of one large antenna.

For example, you could use radar on a series of blimps, each 100 nautical miles apart, and synchronize the beams.

The resolution would be close to the resolution of one antenna with a real aperture of 100 nautical mile width.

Instead of blimps, these could be two (or more) UAVs, fighter jets, or low-earth-orbiting satellites.

Spotlight synthetic aperture radar

Also, we can use spotlight synthetic aperture radar, in which one antenna in motion is used to emulate a large antenna. Or, for bi-static spotlight synthetic aperture radar, both the transmit and receive antennas can be in motion.

Time Difference of Arrival Beam Sharpening

Another technique for narrow beams is to use the Time Difference of Arrival of the microwaves to create a "Virtual" beam. For example, assume a monostatic radar in which you transmit a beam from a craft to the earth. The beam could be a sharp pulse or it could be a "colored" continuous wave (CW), e.g., a CW with constantly changing frequency.

If you transmit the beam at an angle to the earth, the reflected microwaves from the edge of the beam closest to the radar will be detected, after reflection from earth, before the reflected microwaves from the most distance edge of the beam. Thus, one can use the time of arrival to filter the reflected microwaves, to create ISO Time-Of-Arrival "Virtual Beams" of various sub-regions of the real beam, such as the closest edge, most distance edge, middle, etc.

In surveillance radar, a small beamwidth can be a disadvantage, because you need more sweeps to examine the area of interest.

For surveillance radar, using older technology, you needed a wide beamwidth, so you could pick up targets in a wide area for each second of the sweep.

However, with the increasing power of digital computers, and AESA phased-array antennas, you can sweep a multitude of narrow beams per second, thus achieving long-range surveillance with narrow beamwidths.

The density of transistors has been doubling each 18-24 months, in what has become known as Moore's Law. Moore's Law is is expected to continue for the next 10-15 years.

Intel CEO Paul Otellini announced in 2006 plans to ship a "teraflop" processor in five years with 80 cores . Intel has already built a prototype of the processor with 80 cores that can perform a trillion floating-point operations per second.

We could assign one core (CPU) per beam, and thus one processor could track 80 beams, 100 processors 8,000 beams, and 1,000 processors 80,000 beams.